

**COUNTY:** CORSON  
**LEGAL LOCATION:** NENW 26-18N-21E  
**API NO:** 40 031 05057  
**PERMIT NO:** 314  
**WELL NAME:** KILROY #1 SCHOLL  
**OPERATOR:** W.S. KILROY & H.L.  
SWINDLER  
**PERMIT ISSUED:** 06/21/1961  
**PERMIT CLOSED:** 04/10/1963  
**FILE LOCATION:** 118N-21W-26 NENW

**TARGET CODES:**

**WELL HISTORY / CHECKLIST**

**PERMIT TO DRILL / INTENT TO DRILL**

**WELL INSPECTION / SCOUT REPORTS**

**OPERATOR'S TECHNICAL REPORTS / MAPS**

**ADMINISTRATIVE / SUNDRY REPORTS**

**CORRESPONDENCE**

**MISCELLANEOUS**

# **WELL HISTORY / CHECKLIST**

# WELL HISTORY

Well Name Kilroy #1 Scholl Permit No. \_\_\_\_\_

Location NENW 26-18N-21E Corson Date of Permit \_\_\_\_\_

Elev. 2311 Gr. 2323 K.E. API No. \_\_\_\_\_

Confidential X From \_\_\_\_\_ To \_\_\_\_\_

Logs Received \_\_\_\_\_

Cuttings Received \_\_\_\_\_ Cores Received \_\_\_\_\_

Drill Stem Records \_\_\_\_\_

Cap Plug and Marker Set \_\_\_\_\_

Surface Restored \_\_\_\_\_

Plugging Affidavit Signed \_\_\_\_\_ Date \_\_\_\_\_

Bond Released \_\_\_\_\_ Date 4-23-63

## Summary of Scout Reports

6-28-61 First visit - Spudded 6-28-61

2-7-62 10 sax surface plug had been placed. Rig moved

The mud pit is fenced but not filled.

6-5-62 The mud pit is fenced but has not been filled. Junk

on location.

8-24-62 Mud pits not filled

10-13-62 Pit not filled.

4-5-63 Pits had been filled. Junk removed.

# **PERMIT TO DRILL / INTENT TO DRILL**

JUN 28 1961  
W

Form 4

State of South Dakota  
State Oil and Gas Board

PERMIT TO DRILL FOR OIL AND GAS

Pursuant to Notice heretofore given and filed with said board as required by law, authority is hereby granted to.....W. S. Kilroy.....  
2150 First National Bank Bldg.  
of .....Denver, Colorado..... to drill a well for (oil and gas)  
City State  
upon the lands situated in.....CORSON.....County, South Dakota and described as follows:  
.....C NE NW/4 Sec. 26-T18N-R21E.....  
.....

This permit is granted upon the express representations contained in said Notice of Intention to Drill and upon the following information:

The exact location of the well to be drilled is.....C NE NW/4 Section 26, T. 18 N.,  
R- 21E, Corson, County, South Dakota......

The name and address of the owners are.....W. S. Kilroy-2150 First National Bank  
Bldg. Denver 2, Colorado, and J. S. Swindler, 1601 West Okmulgee,  
Muskogee, Oklahoma......

The names and addresses of the operators, contractor or driller is.....W. S. Kilroy, 2150  
First National Bank Bldg. Denver 2, Colorado and Circle A Drilling  
Co., Inc., 340 Denver Hilton Bldg., Denver 2, Colorado......

That the names and addresses of all other persons responsible for the conduct of drilling operations are:

....Same as above.....  
.....  
.....

This permit is issued pursuant to Chapter 42.07 SDC Supp. and all laws amendatory, relevant or supplemental thereto and upon the express condition that the person to whom issued shall at all times be subject to the rules and regulations heretofore or hereafter promulgated by the board.

And, further, this permit is issued upon the express conditions that the.....  
shall furnish to the State Geologist, a complete set of cuttings and if available, two sets of the Geophysical Logs be furnished to the Secretary of the Oil and Gas Board, Pierre, South Dakota.

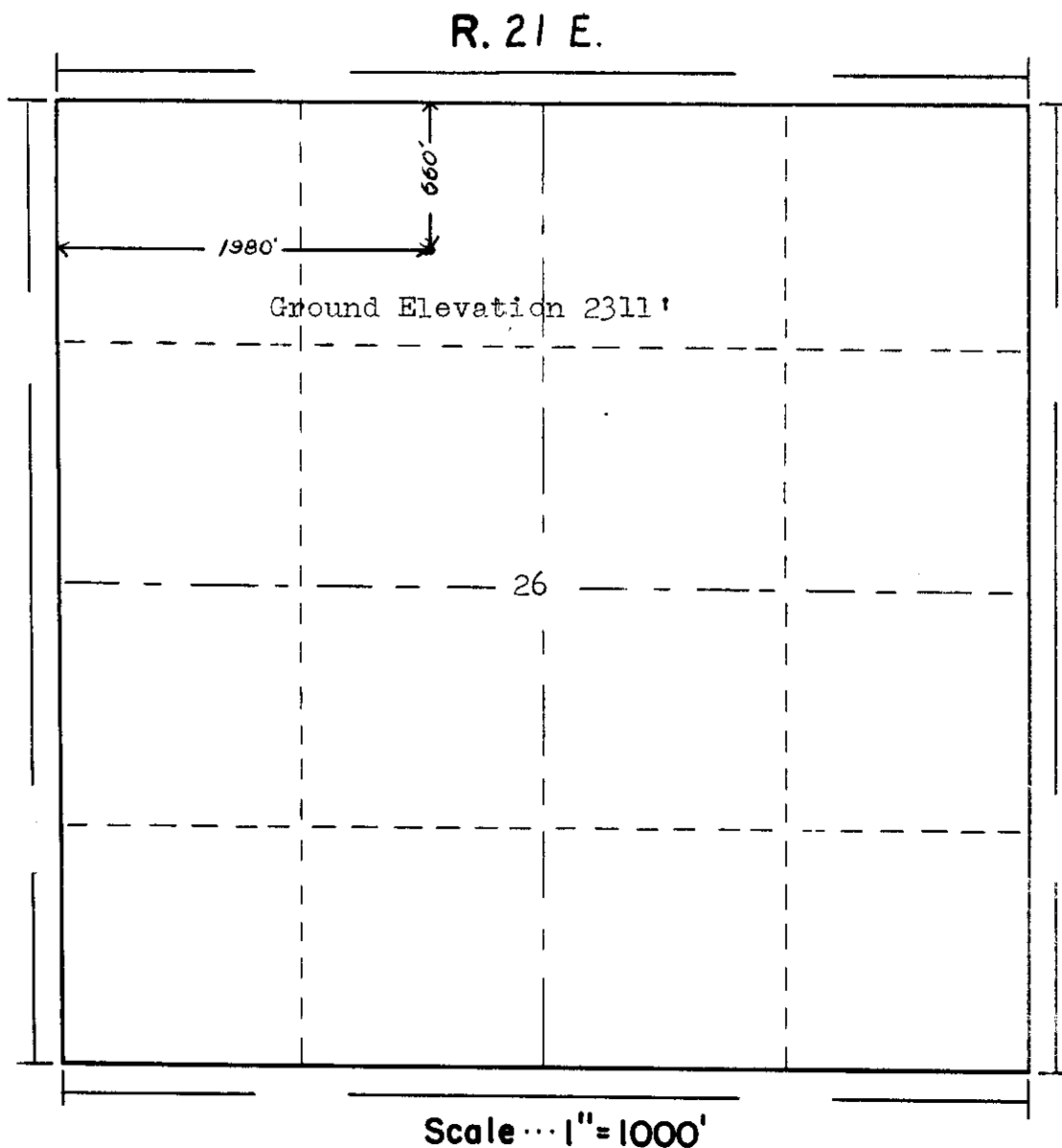
Dated at Pierre, South Dakota this....21st...day of.....June.....A. D., 1961..

STATE OIL AND GAS BOARD

ATTEST:

.....Essie Kiedensman.....  
Secretary

.....Archie Hubbard.....  
Governor, Ex Officio Chairman



**Powers Elevation Company of Denver, Colorado**  
 has in accordance with a request from Mr. Waltman  
 for The Kilroy Company of Texas **determined the**  
**Location of** W. S. Kilroy - J. S. Swindler  
 No. 1 Scholl  
**to be** C NE NW **Section 26 Township 18 North**  
**Range 21 East of Black Hills Meridian**  
 Corson **County, South Dakota**

**The above Plat shows the location of the well site  
 in said section.**

**Powers Elevation Company**

by: *S. T. Badley*

**Date:** June 20, 1961

**Registered Land Surveyor**

JUN 28 1961

STATE OIL AND GAS BOARD  
PIERRE, SOUTH DAKOTA  
JUNE 21, 1961

A meeting of the State Oil and Gas Board was held in the office of the Secretary of State at 11:15 o'clock A.M., June 21, 1961.

PRESENT: Archie Gubbrud, Governor; Al Hamre, State Treasurer; Walter Weygint, Assistant Attorney General; Betty Lou Larson, State Auditor; Bernard Linn, Commissioner of School and Public Lands and Alma Larson, Assistant Secretary of State.

Governor Gubbrud called the meeting to order.

Miss Alma Larson, Assistant Secretary, presented to the Board Notice of Intention to Drill for Oil and Gas filed by W.S. Kilroy of Denver, Colorado and J. S. Swindler of Muskogee, Oklahoma, covering #1 Scholl, located on the Center of the NE NW/4 of Section 26, T. 18 N., R. 21 E., Corson County, South Dakota. Said well is covered by bond in the amount of \$3,000.00 executed by the Federal Insurance Company as Surety. Mr. Linn moved that the application be approved and permit granted which permit shall require W. S. Kilroy of Denver, Colorado to furnish to Dr. Allen F. Agnew, State Geologist, Vermillion, South Dakota, a complete set of cuttings; and if available, two sets of Geophysical Logs be furnished to the Secretary of the Oil and Gas Board, Pierre, South Dakota.

Seconded by Mr. Weygint.

All voted "aye" and motion carried.

State of South Dakota  
State Oil and Gas Board

## NOTICE OF INTENTION TO DRILL FOR OIL AND GAS

Denver, Colorado, ~~South Dakota~~, June 12, 1961

## STATE OIL AND GAS BOARD

Pierre, South Dakota

In compliance with Chapter 42.07 SDC Supp. and all laws amendatory, relevant, or supplemental thereto and Rules and Regulations of the Oil and Gas Board, notice is hereby given that it is our intention to commence the work of drilling oil and gas well Sudheimer  
(Name, if any)

No. 1, on Section 26, Township 18 North, Range 21 East, Field WildcatCounty of Corson Lease consists of 160 acresName and Address of owner of the surface of the land Alice M. Sudheimer, 1905 Bayard Ave., St. Paul 16, Minn.Name and address of owner of the well W. S. Kilroy, 2150 First National Bank Bldg., Denver 2, Colo.  
H. L. Swindler, 1601 West Okmulgee, Muskogee, Okla.Name and address of operator W. S. Kilroy, 2150 First National Bank Bldg., Denver 2, Colo.Name and address of contractor Circle A Drilling Co., Inc., 340 Denver Hilton Bldg., Denver 2, Colo.Name and address of driller Same as above.Name and address of any other person responsible for the conduct of drilling operations Same as above.

The well is 660 feet ~~North~~ or South, and 660 feet ~~East~~ or West from the  
Northeast - NW 1/4 Corner of Section 26, Township 18 North,

Range 21 East, of the Black Hills Meridian.  
(Give location in distance from section corners of legal subdivision)The elevation of the ~~surface~~ ground above sea level is 2300 feetWe estimate that the first productive oil or gas sand should be encountered at a depth of about 4400 feet.

We propose to use the following strings of casing, either cementing or landing them as herein indicated:

| Size of Casing<br>Inches                         | Weight, Lb.<br>Per Foot | Grade & Type | Depth | Landed or Cemented |
|--------------------------------------------------|-------------------------|--------------|-------|--------------------|
| 8-5/8                                            | 32                      | J            | 300   | Cemented           |
| Production string to be determined at later date |                         |              |       |                    |
|                                                  |                         |              |       |                    |

Well is to be drilled with ~~rotary~~ rotary tools.

It is understood that if changes in this plan become necessary we are to notify you before cementing or landing casing.

Address 2150 First National Bank Bldg., Denver 2, Colorado Name of owner, operator, driller or contractor W. S. KilroyTelephone number Keystone 4-0816 Signature of operator W. S. Kilroy

OK.  
B.R.  
OK to  
new location  
as per title  
6/14/61  
3:00 PM.  
MK

# **WELL INSPECTION / SCOUT REPORTS**

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted.....April 5, 1963.....

Designation of well....#1 Scholl.....

Owner.....Kilroy.....

Location: Sec. 26 T. 18 N. ~~S~~ R. 21 E. W.

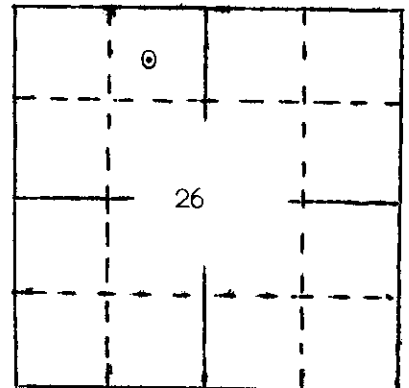
.....Corson.....County, S.D. Total Depth.....6128..... feet

Casing Record:

8 5/8" 350 Ft. Ft.  
Ft. Ft.

Work in progress at time of visit:

NONE



Developments since last visit:

Pits had been filled. Junk had been removed from location.

Remarks and recommendations:

Scouted by.....Earl Cox, Geologist.....

Approved by .....Allen F. Agnew.....  
State Geologist

# STATE GEOLOGICAL SURVEY

## Scout Report

Date scouted.....October 13, 1962.....

Designation of well.....#1 Scholl.....

Owner.....Kilroy.....

Location: Sec. 26 T. 18 N. 5 R. 21 E. W.

.....Corson.....County, S.D. Total Depth....6128..... feet

### Casing Record:

8 5/8" 350 Ft.          Ft.  
         Ft.          Ft.

Work in progress at time of visit:

None

Pit not filled. Pit is fenced and has some water in it.

|  |    |  |  |
|--|----|--|--|
|  | 0  |  |  |
|  |    |  |  |
|  | 26 |  |  |
|  |    |  |  |
|  |    |  |  |

Developments since last visit:

Remarks and recommendations:

Scouted by.....Earl Cox, Geologist.....

Approved by .....*Allen F. Agnew*.....  
Allen F. Agnew, State Geologist

# STATE GEOLOGICAL SURVEY

## Scout Report

Date scouted. August 24, 1962.

Designation of well... #1 Scholl.....

Owner..... Kilroy.....

Location: Sec. 26 T. 18 N. S. R. 21 E. 34.

..... Carson..... County, S.D. Total Depth.. 6128..... feet

### Casing Record:

8 5/8" 328 Ft. Ft.  
Ft. Ft.

Work in progress at time of visit:

None

|  |   |    |  |
|--|---|----|--|
|  |   |    |  |
|  | 0 |    |  |
|  |   |    |  |
|  |   | 26 |  |
|  |   |    |  |
|  |   |    |  |

Developments since last visit:

### Remarks and recommendations:

Mud pits not filled.

Scouted by... Earl Cox, Geologist.....

Approved By Allen F. Agnew  
Allen F. Agnew, State Geologist

# STATE GEOLOGICAL SURVEY

## Scout Report

Date scouted... June 5, 1962...

Designation of well... #1 Scholl

Owner... Kilroy

Location: Sec. 26 T. 18 N. 3. R. 21 E. W.

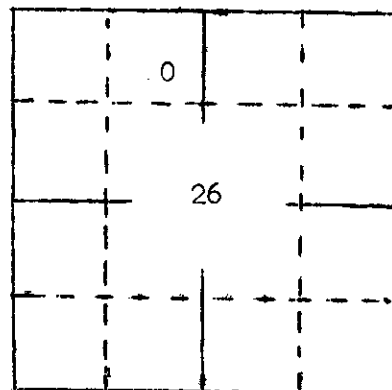
Corson County, S.D. Total Depth... 6128 feet

### Casing Record:

8 5/8" 328 Ft. Ft.  
Ft. Ft.

### Work in progress at time of visit:

None



### Developments since last visit:

None

### Remarks and recommendations:

The mud pit is fenced but has not been filled.  
The location has some junk on it.

Scouted by... Earl Cox, Geologist

Approved By... Allen F. Agnew  
Allen F. Agnew, State Geologist

# STATE GEOLOGICAL SURVEY

## Scout Report

Date scouted **Feb. 7, 1962**

Designation of Well **#1 Scholl**

Owner **Kilroy**

Location: Sec. **26** T. **18** N **1/2**, R. **21** E **1/2**

**Corson** County, S. D. Total Depth **6128** feet

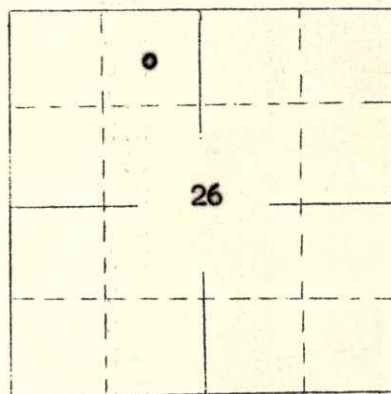
### Casing Record:

**8 5/8"** **328** Ft. \_\_\_\_\_ Ft.

\_\_\_\_\_ Ft. \_\_\_\_\_ Ft.

Work in progress at time of visit:

**None**



Developments since last visit:

The 10 sack surface plug had been placed.  
The location marker pipe had been placed.  
The rig had been moved off the location.

Remarks and recommendations:

The mud pit is fenced but has not been filled.  
The location has some junk on it.

**Earl Cox, Geologist**

Scouted by \_\_\_\_\_

Approved by *Allen F. Agnew*

**Allen F. Agnew, State Geologist**

12-10-61

~~No cores~~ Splored 7/19/62

Pits not filled 1-29-62

Same 2/7/62

Same 6/5/62

Same 8/24/62

## STATE GEOLOGICAL SURVEY

## Scout Report

Date scouted...7-23-61.....

Designation of well...#1 Scholl.....

Owner.....Kilroy.....

Location: Sec. 26 T. 18 N./S. R. 21 E./W.

.....Corson.....County, S.D. Total Depth...6128..... feet

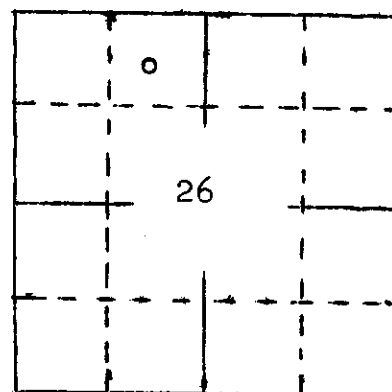
## Casing Record:

8 5/8      328      Ft.      Ft.  
                                  Ft.      Ft.

## Work in progress at time of visit:

## Plugged as follows:

270-360      30sx      base of surface casing  
 3210-3300      30sx      across Dakota  
 4100-4190      30sx      near base of Minnelusa  
 4560-4650      30sx      top of Mission Canyon  
 5760-5850      30sx      top of Red River



10 sx surface plug and marker will be placed 7-24-61

Cores from test are at Belle Fourche office.

## Developments since last visit:

Drilled from 5928-6128. Gamma Sonic and Induction electrolog run.

## Tentative log tops by Kilroy geologist:

|                              |                        |           |              |      |
|------------------------------|------------------------|-----------|--------------|------|
|                              | Greenhorn              | 2460      | Lodge Pole   | 4922 |
|                              | New Castle             | 2997      | Three Forks  | 5244 |
| Remarks and recommendations: | Dakota Silt            | 3235-3250 | Nisku        | 5360 |
|                              | (No Dakota ss present) |           | Duperow      | 5397 |
|                              | Piper                  | 3575      | Souris River | 5490 |
|                              | Lime                   | 3604      | Interlake    | 5590 |
|                              | Minnelusa              | 3737      | Stony mt.    | 5703 |
|                              | Charles                | 4399      | Red River    | 5805 |
|                              | Mission Canyon         | 4605      |              |      |

Scouted by.....Earl Cox, Geol.....

Approved by.....

State Geologist

CONFIDENTIAL

CONFIDENTIAL

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted... July 20, 1961..

Designation of well... #1 Scholl .....

Owner..... Kilroy .....

Location: Sec. 26 T. 18 N.  $\frac{3}{4}$  R. 21 E.  $\frac{1}{4}$  .....

..... Corson ..... County, S.D. Total Depth.... 5928 ..... feet

Casing Record:

8 5/8" 350 Ft. .... Ft.

..... Ft. .... Ft.

Work in progress at time of visit:

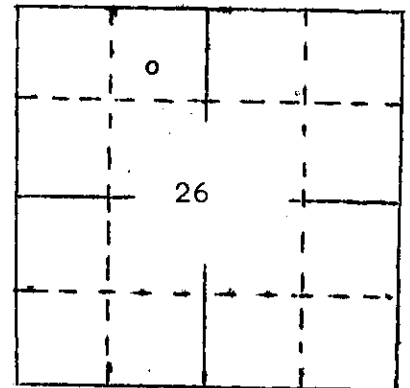
Drilling at 5928'

Tops:

Three Forks 5254

Interlake 5595

Red River 5807



Developments since last visit:

Core # 1 5832-5842 Recovered 10', no shows

Core # 2 5876-5897 No shows

Remarks and recommendations:

DST # 3 5873-5897 - Recovered 600' water cut mud and 2060' black sulphur water.

SIP: 2287-2482; FP: 248-1039; HP: 3286-3258

Max. Temp. - 135°

Scouted by... Earl Cox, Geologist .....

Approved by .....

Allen F. Agnew, State Geologist

CONFIDENTIAL

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted...July.14. 1961.

Designation of well.....#1 Scholl.....

Owner.....Kilroy.....

Location: Sec. 26 T. 18 N. ~~18~~ R. 21 E. ~~18~~

.....Corson.....County, S.D. Total Depth.....5175..... feet

Casing Record:

8 5/8" 350 Ft. Ft.  
Ft. Ft.

Work in progress at time of visit:

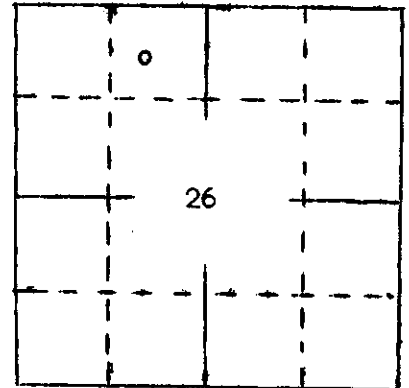
Drilling at 5175'

Tops:

Charles - 4399  
Mission Canyon 4652  
Lodgepole 4883

Corrected tops:

Greenhorn 2515  
Mowry 2613 (?)



Developments since last visit:

DST #1 4470-4558 - Blow immediate and weak, increased to strong in 22 min., remained strong till shut-in except occasional pressure drops. Initial shut-in 30 min., tool open 2 hours; final shut-in 2 hours. Recovered 945' muddy water.

SIP: 2024-1954; FP: 126-452; HP: 2506-2492, Maximum temp. 134°

DST # 2-4583-4743 - Blow increased to strong in 60 seconds, remained strong remainder of open period. Initial shut-in 30 minutes, tool open 1 hour. Final shut-in 30 minutes. Recovered 2737' muddy sulphur water.

~~Remarks and recommendations:~~

SIP: 2065-2065; FP: 352-477; HP: 2865-2465

Both DST's taken on account of good porosity.

Scouted by...Earl Cox, Geologist.....

Approved by.....  
Allen F. Agnew, State Geologist

CONFIDENTIAL INFORMATION

STATE GEOLOGICAL SURVEY

Scout Report

Date scouted.....July 8, 1961..

Designation of well.....#1 Scholl.....

Owner.....Kilroy.....

Location: Sec. 26 T. 18 N. ## R. 21 E. ##.

.....Corson.....County, S.D. Total Depth.....4512..... feet

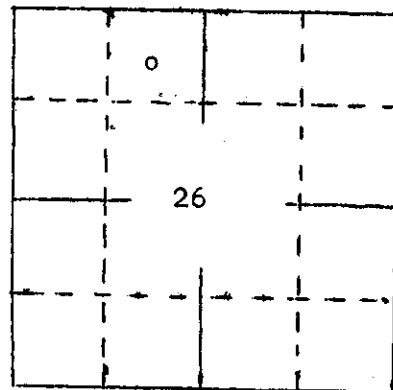
Casing Record:

8 5/8" 350 Ft. Ft.  
Ft. Ft.

Work in progress at time of visit:

Drilling at 4512'

Estimated T.D. 6100' - 6200' or 300' into Red River.



Developments since last visit:

Drilled from 350' - 4512'

Geologist on well is Ted Sheldon, Finley Motel, Isabel, South Dakota

Remarks and recommendations: Sample tops:

|                                       |                                               |
|---------------------------------------|-----------------------------------------------|
| Greenhorn - 2615                      | Piper - 3603                                  |
| Mowry 2830 (?)                        | Spearfish - 3709                              |
| Newcastle 3024                        | Minnekahta - 3801                             |
| Skull Creek 3047                      | Opeche - 3831                                 |
| Dakota 3293 (flowed until mudded off) | Minnelusa-Amsden (undifferentiated) 3920± 20' |
| Swift 3324                            |                                               |

Scouted by.....Earl Cox, Geologist.....

Approved by.....Allen F. Agnew, State Geologist.....

# STATE GEOLOGICAL SURVEY

## Scout Report

Date scouted..... June 28, 1961

Designation of well..... #1 Scholl

Owner..... Kilroy

Location: Sec. 26 T. 18 N. 8/ R. 21 E. 1/4/

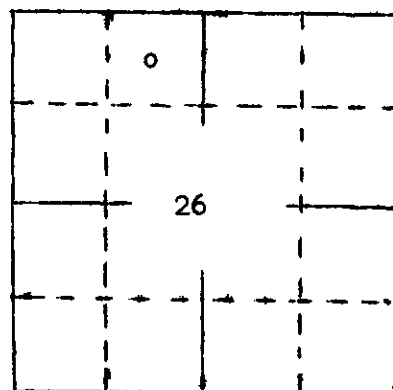
Corson..... County, S.D. Total Depth..... 350..... feet

### Casing Record:

8 5/8" 350 Ft. Ft.  
Ft. Ft.

### Work in progress at time of visit:

Waiting on cement after setting 350' of 8 5/8" surface casing with 180 sacks.



### Developments since last visit:

Spudded 6/28/61 at 7:00 A.M.

### Remarks and recommendations:

A. Vitali - Company Geologist  
Room 3, Finley Motel, Isabel, S. Dak.  
Phone - 466-3121

Scouted by..... Earl Cox, Geologist

Approved by..... Allen F. Agnew, State Geologist

### NOTE

ALL INFORMATION ON THIS WELL IS CONFIDENTIAL.

T T G

Kilroy-Swindler #1 Scholl  
660 S, 660 W NE/C 26-18N-21E, Carson Co.

W.S. Kilroy, 2150 - 1st Natl Bank Bldg  
Denver 2, Colo KEystone 4-0816

H.L. Swindler, 1601 W. Ok mulgee,  
Muskogee, Okla

Circle A Drilg Co., 340 Denver Hilton Bldg  
Denver 2, Colo.

R.M. Waltman, Geologist  
A. Vitalis, Geol.  
R. S. Finley, Hotel  
Isabel  
Ph 466-3121

AT. 2300

Permit 6/21/61

TD 4400

Aug 1960

Humble scout says will drill it, 7 mi  
N, 2 W of Isabel.

8-29-60

No activity

9-7-60

No activity

9-16-60

Kilroy-Swindler #1 Woodall, 33-18N-21E

9-19-60

No activity

11-30-60

Letter to Waltman

12-29-60

Waltman reply

June 61

Waltman called. Will start last part of June. NE 26-18N-21E. Will get forms from Essie. Circle A Dril Co (formerly Anschutz).  
6-28

Cox scouted

spend 6-28. Set 350' of  $8\frac{3}{8}$ " w 180 sx. Tite hole.

7-5

on 7/1 @ 3250. Gn horn spl top @ 3250  $\pm$ .

7-8

@ 4512 Est TD 6100-6350 in RR.

Spl tops

Gn 2615 2515

Mon ~~2830~~ 2613?

New 3024

sb Cr. 3047

Dck. 3293 Flowed until mudded off

Swift 3324

Piper 3603?

Spey 3709?

Mk 3801?

ep 3831?

Me 3920  $\pm$  20?

7-14

Cox scouted. @ 5175-6PM

Spl tops

Chas 4399

MC 4652

Lodge 4883

DST #1 4470-4558 Blow mixed  
& wk, in to strong in 22 min.  
strong till SI except occas. pres,  
drop.

ISI 30 min open 2 hrs FSI 2 hrs  
Rec 945' MW

SIP 2024-1954

FP 126-452

HP 2506-2492

Temp 134°

DST #2 4583-4743 Blow mixed  
to strong in 1 min. Strong all the  
way

ISI - 30 min open 1 hr, FSI - 1 hr  
Rec 2737' MBS - W.

SIP 2065-2065

FP 352-427

HP 2565-2565

Both DSTs taken because of good porosity.

7-20

@ 5928

Tops 3 Fks 5254  
Int 5595  
RR 5807

Core #1 5832-42 - Rec 10' NS

Core #2 5876-97 - NS

DST #3 5873-97 - rec 600' WCM +  
2060' blk S=W, SIP 2287-2482,  
FP 248-1039, HP 3286-3258.

Temp 135°.

7-23

TD 6128

Drilled 5928-6128. GRC Sonic, Ind.

Elec logs run. Log tops

|         |         |          |      |
|---------|---------|----------|------|
| Gn      | 2460    | Coalex   | 4922 |
| Newc    | 2997    | 3 Fks    | 5244 |
| Daksilt | 3235-50 | Niska    | 5360 |
| Piper   | 3575    | Daf      | 5397 |
| " Is    | 3604    | Sannisk  | 5490 |
| ML      | 3737    | Interl.  | 5590 |
| Chas    | 4399    | Stony Mt | 5703 |
| MC      | 4605    | RR       | 5805 |

| Plugged   | Sx |           |
|-----------|----|-----------|
| 270-360   | 30 | Base surf |
| 3210-3300 | "  | Dakota    |
| 4100-4190 | "  | base ML   |
| 4560-4650 | "  | Top MC    |
| 5760-5850 | "  | Top RR    |

10 SX surf. plug + marker will be placed 7-24-61.

Cores at B/F ofc.

Spls to Ames tract

K1J y-Swindler #1 Schobl  
 NENW - 26-18N-21E. CORSON CO.  
 Gd 2311  
 Elev. KB 2323 Permit: 6-21-61  
 Td: 6100-6200 - 3008 into RR  
 Achilli Vitali - Geol.  
 phone 466-3121 Room 3  
 Finley motel - Isabelle, S. Dak  
 R.M. Waltman - Area Geol.  
 Keystone 4-0816 Denver.  
 Circle A Drilling Co.  
 Pushor - Waddell  
 Am Strat will Sent Sample  
 6-24-61  
 Scouted - Rig being moved W.  
 Estimated Drilling time 25 days  
 Spotted 6-28-61 7:00 A.M.

Scouted 7-1-61  
 Spotted Hat set surface  
 at 5:30 P.M. 350' at 850'  
 24" with 180 app 4296 Cal  
 Got Good returns of Cement  
 7-1-61  
 making trip at 3250.  
 Sample top Greenhorn 2500 ±  
 4370 3350  
 3223 1210  
 121 4569

7-8-dnd

② 45/12' top of bedding level  
Greenham 25-1/2'  
Bella Fork 243.  
Mowry 2830.  
New Castle 3024.  
② Seal R 3047  
Dak 3293 (Flowed  
but shut off by mud)  
St. Swift (below Dak) 3324  
Pupar 3603  
Spengish 3709  
Mendota 3801  
Opache 3831 (and 3841)  
Blinn - Combs 3929 to 20'

Turnkey 6 DST 4/150' Center

7-8-15 (100' on)

Sealed 7-14-61

② 5175

Top 4397 Charles  
4652 Miss Conner  
4883 Lodepole

2/ DST 4470-4558

Blow-medicine + week, increased  
to strong in 22 min. Remained

Strong till shut in except  
occasional pressure drop  
Cool open 2 hrs - shut in 30 min  
Final shut in 2 hrs 15 min.

Run 745' muds well

DSP 2024-19154

FP 126-452

HP 2506-2492

Max temp 134°

which DST taken on account  
of porosity.

Blow increased to strong in 20 min,  
remained strong enough to open  
period no gas to surface  
used open 1 hr  
Final shut in 30 min  
Final shut 1 hour  
Fluid recovered 2737.  
2737 - mostly black rubber  
SIP 2065-2065

2/ DST 4583-4743

7-20-64

5928

5807 R. River Top

5254 Three Forks

~~5575~~ 5575 Antelope

Cone #1 5832-42 Bu 10'

#2 5826-97

DST #3 5823-97

Roe 9660' Fluid

600' water cut mud

2000 Black oil water

SIP 2287-2482

FP 248-1039

HP 3286-3258

Max temp 135°

7-22-61

Vital 1 Colled - Red T.P. at

6128 End Run Jojo - Amur

and Antelope - Red T.P.

stuck with Antelope

Log Ant 328'

Log for Tentative

5807 2460

N. Crest 2997

Dak 55 3250 / 100 SD

Dak 55 3235

Piper 33-75

2100 3604

Murkin 3737

Charles 4399

Murkin 4605

Log 4922

3 Forks 5244

Antelope 5360

Deponer 5397

Jarvis River 5490

Antelope 5590

St. Mt. 5703

B. R. 5805

Sup. Cr.

Aug

Aug 1

1000

278-360

base surface 3000

3310-3370

across Ditch 3000

4100-4170

top Road up mud

4560-4650

top Mica 3000

5740-5850

top RR 3000

16000

Am Street will

Sent

Samples to

Cone tator to

Belle Fodder

Sand up to

15 GS when

Released

Scouted

Feb 7, 1962

1000 Aug 1st

1000 Aug 1st

1000 Aug 1st

1000 Aug 1st

1000 Aug 1st

1000 Aug 1st

1000 Aug 1st

August 23, 1962  
Scouted - 1000 mud 1000  
1000 mud 1000 mud 1000

April 15, 1963

Scouted. Pits filled up. The  
Dust over pit is heaviest higher than  
surrounding surface & its depth  
as work done with ground  
troops. Numerous & open for  
the stock & no place for water  
to collect.

April 23, 1963

Scouted

**OPERATOR'S  
TECHNICAL  
REPORTS / MAPS**

A LANE COMPANY PRODUCT, INC.

FILE NO.

S.O. 13373

COMPANY W.S. KILROY & J.S. SWINDLER

WELL SCHOLL NO. 1

FIELD WILDCAT

COUNTY CORSON STATE SO DAKOTA

LOCATION:

C NE NW

SEC 26 TWP 18N RGE 21E

Other Services

F/L

G/R - A/L

Elevations:

KB 2323

DF

GL 2311

Elev. 2323

Fl. Above Permanent Datum

Permanent Datum KELLY BUSHING

Log Measured from K.B.

Drilling Measured from KELLY BUSHING

Date 7-21-61

Run No. ONE

Depth—Driller 6126

Depth—logger 6129

Bottom logged interval 6128

Top logged interval 328

Casing—Driller 8 5/8 @ 350

Casing—logger 328

Bit Size 7 7/8

Type Fluid in Hole LOW PH

Density and Viscosity OBROXIN

PH and Fluid Loss 10.8 52

Source of Sample 8.0 98 cc

Rm @ Meas. Temp. FLOWLINE

Rmf @ Meas. Temp. 11.3 @ 74 F

Rmc @ Meas. Temp. 1.0 @ 76 F

Source of Rmf and Rmc 1.9 @ 78 F

Rm @ BHT FILTER PRESS

Time Since Circ. 0.62 @ 135 F

Max. Rec. Temp. Deg. F. 3 HRS.

Equip. No. and Location L 461Z NEWC

Recorded By MOSES

Witnessed By MR VITALI - MR SHELTON

S.D. Geol. Survey  
Western Field Office  
Rapid City S.D.

FOLD HERE

THIS HEADING AND LOG CONFORMS TO API RECOMMENDED STANDARD PRACTICE RP-31

REMARKS R<sub>w</sub> DST NO.1=0.089 AT 135° F.  
R<sub>w</sub> DST NO.2=0.71 AT 135° F.  
R<sub>w</sub> DST NO.3=0.91 AT 135° F.

Changes in Mud Type or Additional Samples

Date Sample No.

Scale Changes

Type Log

Depth

Scale Up Hole

Scale Down Hole

AUG 14 1961

# WELL REPORT

W. S. Kilroy and J. S. Swindler

#1 Scholl

Location: C NE NW Section 26-T18N-R21E  
Corson County, South Dakota  
Elevation: 2311' Ground, 2323' KB  
Spudded: June 28, 1961  
Completed: July 23, 1961  
Status: Plugged and abandoned  
Total Depth: 6128' Driller; 6129' Lane Wells  
Casing: 11 jts. (338') 8-5/8" 24# @ 350 w/180 sacks  
Hole Size: 12 1/2" to 355'; 7-7/8" from 355' to TD  
Contractor: Circle A Drilling Co.  
Mud Engineering: Mud Control  
Mud Logging: Continental Lab  
Logs: Lane Wells Induction Electric; Gamma Ray - Acoustic; and Focused  
Lost Circulation: 5099' (top Lodgepole porosity)  
Junk in Hole: None

|        |                              |                                        |           |
|--------|------------------------------|----------------------------------------|-----------|
| Plugs: | 10 sx Top of surface         | 30 sx Top of Roundtop mem of Minnelusa | 4100-4190 |
|        | 30 sx Across base of surface | 270-360 30 sx Top of Mission Canyon    | 4550-4650 |
|        | 30 sx Across Dakota          | 3210-3300 30 sx Top of Red River       | 5760-5850 |

CONFIDENTIAL

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# WELL HISTORY

| <u>Date</u> | <u>Operation</u>          | <u>Depth</u><br><u>From</u> <u>To</u> |      | <u>Hole</u><br><u>Size</u> | <u>Weight</u><br><u>on Bit</u> | <u>Pump</u><br><u>Pressure</u> | <u>Rotary</u><br><u>RPM</u> | <u>Remarks</u>                                                                                            |
|-------------|---------------------------|---------------------------------------|------|----------------------------|--------------------------------|--------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------|
| 6-25-61     | Rigging Up                |                                       |      |                            |                                |                                |                             |                                                                                                           |
| 6-26-61     | Rigging Up                |                                       |      |                            |                                |                                |                             |                                                                                                           |
| 6-27-61     | Rigging Up                |                                       |      |                            |                                |                                |                             |                                                                                                           |
| 6-28-61     | Rigging Up<br>Drilling    | 0                                     | 355  | 12½"                       |                                |                                |                             | 9 hrs, dug rat and mouse hole<br>7 hrs, deviation: ½° @ 100', ½° @ 200',<br>½° @ 300'                     |
|             | Running Pipe<br>Cementing |                                       | 350  |                            |                                |                                |                             | 2½ hrs, 8-5/8", 24#, 338' (11 Jts.)<br>1 hr, with 180 sx reg w/2% calcium<br>chloride<br>4½ hrs.          |
|             | W.O.C.                    |                                       |      |                            |                                |                                |                             |                                                                                                           |
| 6-29-61     | W.O.C.<br>Drilling        | 355                                   | 633  | 7-7/8"                     | 20,000#                        | 900#                           | 125                         | 19 hrs, nipples up and tested @ 500#<br>5 hrs.                                                            |
| 6-30-61     | Drilling<br>Repairing     | 633                                   | 2984 | 7-7/8"                     | 20,000#                        | 700/900#                       | 190                         | 21-3/4 hrs; deviation: 3/4° @ 1004',<br>½° @ 2000'<br>2½ hrs - mud pump and air lines                     |
| 7- 1-61     | Drilling<br>Repairing     | 2984                                  | 3385 | 7-7/8"                     | 20/25,000#                     | 300/800#                       | 110/150                     | 21-3/4 hrs; plugged bit, reamed to bot<br>hole deviation: ½° @ 3013'<br>3½ hrs - pump motor and air lines |
| 7- 2-61     | Drilling<br>Repairing     | 3385                                  | 3642 | 7-7/8"                     | 25/30,000#                     | 300#                           | 110                         | 22½ hrs - reamed @ 1480. Mudded up<br>1-3/4 hrs - mud pump and swivel                                     |
| 7- 3-61     | Drilling                  | 3642                                  | 3844 | 7-7/8"                     | 30,000#                        | 350/700#                       | 110                         | 24 hrs, 1½ hrs cutting drilling line                                                                      |
| 7- 4-61     | Drilling<br>Repairing     | 3844                                  | 4005 | 7-7/8"                     | 30,000#                        | 700#                           | 110                         | 22½ hrs - reamed bot 30'<br>hole deviation: 1° @ 3958'<br>1-3/4 hrs - hydraulic hoses                     |

WELL HISTORY - Contd.

| <u>Date</u> | <u>Operation</u> | <u>Depth</u><br><u>From</u> <u>To</u> |      | <u>Hole</u><br><u>Size</u> | <u>Weight</u><br><u>on Bit</u> | <u>Pump</u><br><u>Pressure</u> | <u>Rotary</u><br><u>RPM</u> | <u>Remarks</u>                                                                              |
|-------------|------------------|---------------------------------------|------|----------------------------|--------------------------------|--------------------------------|-----------------------------|---------------------------------------------------------------------------------------------|
| 7- 5-61     | Drilling         | 4005                                  | 4120 | 7-7/8"                     | 30/35,000#                     | 650/700#                       | 110/95                      | Reamed Bridge @ 1300'                                                                       |
| 7- 6-61     | Drilling         | 4120                                  | 4269 | 7-7/8"                     | 35,000#                        | 650/700#                       | 90                          | Reamed @ 1350' and bot 15' (½ hr)                                                           |
| 7-7- 61     | Drilling         | 4269                                  | 4439 | 7-7/8"                     | 35,000#                        | 650/700#                       | 90                          | Reamed @ 1350' and at bottom (½ hr)                                                         |
| 7- 8-61     | Drilling         | 4439                                  | 4558 | 7-7/8"                     | 35,000#                        | 650/700#                       | 90                          | 23 hrs; reamed @ 1100' and bot 20'.<br>hole deviation: ½° @ 4460'<br>1 hr working on brakes |
|             | Repairing        |                                       |      |                            |                                |                                |                             |                                                                                             |
| 7- 9-61     | Condition Mud    |                                       | 4558 |                            |                                |                                |                             | 3½ hrs -Preparing to test                                                                   |
|             | Testing          | 4470                                  | 4558 |                            |                                |                                |                             | 11 hrs - DST #1, rec 945' muddy water                                                       |
|             | Drilling         | 4558                                  | 4576 | 7-7/8"                     | 35,000#                        | 700#                           | 95                          | 9½ hrs, reamed bot 33', cleaned pits                                                        |
| 7-10-61     | Drilling         | 4576                                  | 4743 | 7-7/8"                     | 35,000#                        | 650/700#                       | 75/90                       | tight hole 4505-4652', reamed several<br>times (3 hrs)                                      |
| 7-11-61     | Condition Mud    |                                       | 4743 |                            |                                |                                |                             | 1½ hrs                                                                                      |
|             | Testing          | 4583                                  | 4743 |                            |                                |                                |                             | 10 hrs - DST #2, rec 2737' blk muddy<br>sulfur water                                        |
|             | Drilling         | 4743                                  | 4795 | 7-7/8"                     | 35,000#                        | 700#                           | 75                          | 12½ hrs - reamed 1 hr @ Bottom                                                              |
| 7-12-61     | Drilling         | 4795                                  | 4915 | 7-7/8"                     | 35,000#                        | 650/700#                       | 75                          | 21½ hrs                                                                                     |
|             | Repairing        |                                       |      |                            |                                |                                |                             | 2-3/4 hrs working on drawworks.                                                             |
| 7-13-61     | Drilling         | 4915                                  | 5051 | 7-7/8"                     | 35,000#                        | 650/700#                       | 75/100                      | 23½ hrs                                                                                     |
|             | Repairing        |                                       |      |                            |                                |                                |                             | 3/4 hr working on air lines                                                                 |
| 7-14-61     | Drilling         | 5051                                  | 5246 | 7-7/8"                     | 35,000#                        | 600/700                        | 90/110                      | 19½ hrs                                                                                     |
|             | Mixing Mud       |                                       | 5099 |                            |                                |                                |                             | 4-3/4 hrs, lost circ @ 5099', complete                                                      |
| 7-15-61     | Drilling         | 5246                                  | 5385 | 7-7/8"                     | 35,000#                        | 650/700#                       | 90/110                      |                                                                                             |

WELL HISTORY - Contd.

| <u>Date</u> | <u>Operation</u> | <u>Depth</u><br><u>From To</u> | <u>Hole</u><br><u>Size</u> | <u>Weight</u><br><u>on Bit</u> | <u>Pump</u><br><u>Pressure</u> | <u>Rotary</u><br><u>RPM</u> | <u>Remarks</u>                                                     |
|-------------|------------------|--------------------------------|----------------------------|--------------------------------|--------------------------------|-----------------------------|--------------------------------------------------------------------|
| 7-16-61     | Drilling         | 5385 5554                      | 7-7/8"                     | 30/35,000#                     | 650/700#                       | 90                          |                                                                    |
| 7-17-61     | Drilling         | 5554 5751                      | 7-7/8"                     | 30/35,000#                     | 650/700#                       | 90                          | Tight in Interlake porosity                                        |
| 7-18-61     | Drilling         | 5751 5832                      | 7-7/8"                     | 30/35,000#                     | 650#                           | 90                          | 9 hrs, reamed bot 5' (½ hr)                                        |
|             | Circulating      | 5832 5832                      |                            |                                |                                |                             | 1½ hrs, circ up samples, mix mud                                   |
|             | Coring           | 5832 5842                      | 6-1/8"                     | 16,000#                        | 800#                           | 80                          | 13½ hrs, full rec, time incl 2 trips.                              |
| 7-19-61     | Reaming          | 5832 5842                      | 7-7/8"                     |                                |                                |                             | 3/4 hr                                                             |
|             | Drilling         | 5842 5876                      | 7-7/8"                     | 35,000#                        | 500#                           | 90                          | 5 hrs, trip time assigned to coring.                               |
|             | Circulating      | 5876 5876                      |                            |                                |                                |                             | ½ hr, circ up samples, check mud.                                  |
|             | Coring           | 5876 5897                      | 6-1/8"                     | 18,000#                        | 800/950#                       | 72/75                       | 14-3/4 hrs, rec 20', bbl jammed.                                   |
|             | WOO              | 5897 5897                      |                            |                                |                                |                             | ½ hr, getting tester in Isabel.                                    |
|             | Testing          | 5873 5897                      |                            |                                |                                |                             | 2½ hrs - going in hole DST #3                                      |
| 7-20-61     | Testing          | 5873 5897                      |                            |                                |                                |                             | 9 hrs, DST #3, rec 2660' mud & water trip time assigned to testing |
|             | Reaming          | 5876 5897                      | 7-7/8"                     | 20,000#                        | 650#                           | 90                          | 1 hr                                                               |
|             | Drilling         | 5897 6063                      | 7-7/8"                     | 30,000#                        | 650/700#                       | 90                          | 14 hrs                                                             |
| 7-21-61     | Drilling         | 6063 6128                      | 7-7/8"                     | 35,000#                        | 650#                           | 90                          | 6½ hrs                                                             |
|             | Circulating      | 6128 6128                      |                            |                                |                                |                             | 3 hrs, prep to run logs                                            |
|             | Logging          | 6128 6128                      |                            |                                |                                |                             | 6 hrs, ran Lane Wells logs                                         |
|             | Fishing          | 5724 5724                      |                            |                                |                                |                             | 8-3/4 hrs. Stuck focus tool coming out.                            |
| 7-22-61     | Fishing          | 6128 6128                      |                            |                                |                                |                             | 18 hrs. Went in w/overshot, knocked to bot, recovered on 2nd try.  |
|             | Lay down collars |                                |                            |                                |                                |                             | 4 hrs                                                              |
|             | Plugging         | 6128 6128                      |                            |                                |                                |                             | 2 hrs, going in and circulating.                                   |
| 7-23-61     | Plugging         |                                |                            |                                |                                |                             | 8 hrs, began tearing down 7:00 a.m.                                |

# MUD DATA

| Mud Properties |             |                      |                     |           | Mud Additives            |                          |                          |                      |                           |                         |                        |                          |
|----------------|-------------|----------------------|---------------------|-----------|--------------------------|--------------------------|--------------------------|----------------------|---------------------------|-------------------------|------------------------|--------------------------|
| Date           | Weight<br># | Viscos-<br>ity, sec. | Water<br>Loss<br>cc | pH        | Q-broxin<br>(50#<br>sx.) | Driscose<br>(50#<br>sx.) | Walnut<br>Hulls<br>(sx.) | Caustic<br>Soda<br># | (Mica)<br>Seal-<br>Flakes | Control-fiber<br>40#sx. | Control-gel<br>100#sx. | Cotton-<br>seed<br>Hulls |
| 6-29-61        | WATER       |                      |                     |           |                          |                          |                          |                      |                           |                         |                        |                          |
| 6-30-61        | WATER       |                      |                     |           |                          |                          |                          |                      |                           |                         |                        |                          |
| 7- 1-61        | WATER       |                      |                     |           |                          |                          |                          |                      |                           |                         |                        |                          |
| 7- 2-61        | 9.2- 9.6    | 35-37                | 6.0- 6.8            | -         | 10                       | 4                        |                          | 200                  |                           |                         | 20                     |                          |
| 7- 3-61        | 9.4- 9.6    | 42-50                | 8.4-11.0            | -         | 1                        |                          |                          | 25                   |                           |                         |                        |                          |
| 7- 4-61        | 9.6-10.2    | 41-52                | 10.8-16.4           | 8.0-8.5   | 4                        | 4                        |                          | 150                  |                           |                         | 4                      |                          |
| 7- 5-61        | 10.2-10.4   | 43-52                | 5.2-12.0            | 8.0-10.0  | 2                        |                          |                          | 75                   |                           |                         |                        |                          |
| 7- 6-61        | 10.1-10.3   | 40-43                | 11.0-16.0           | 8.0-10.5  | 3                        | 1                        |                          | 200                  |                           |                         |                        |                          |
| 7- 7-61        | 10.1-10.4   | 40-48                | 10.6-11.6           | 10.0-10.5 | 3                        |                          | 1                        | 150                  | 3                         |                         | 4                      | 1                        |
| 7- 8-61        | 10.2-10.8   | 43-51                | 9.6-12.4            | 10.2-10.5 | 3                        | 2                        | 2                        | 125                  | 2                         |                         | 10                     |                          |
| 7- 9-61        | 10.0-10.2   | 47-52                | 9.8-10.2            | 10.0      | 1                        |                          |                          | 25                   | 1                         |                         | 20                     |                          |
| 7-10-61        | 10.2-10.4   | 43-52                | 6.0-10.0            | 10.0-10.5 | 3                        | 3                        | 1                        | 75                   | 2                         |                         | 17                     |                          |
| 7-11-61        | 10.3-10.5   | 50-53                | 8.0- 9.6            | 10.5      | 1                        | 1                        |                          | 25                   | 1                         |                         | 4                      |                          |
| 7-12-61        | 10.4-10.5   | 44-53                | 6.4- 8.4            | 10.2-10.5 | 2                        |                          |                          | 50                   | 2                         |                         |                        |                          |
| 7-13-61        | 10.4-10.5   | 43-50                | 6.0-8.6             | 10.5-11.0 | 2                        |                          |                          | 50                   | 1                         |                         | 10                     |                          |
| 7-14-61        | 10.1-10.5   | 43-51                | 8.0-12.4            | 9 - 10.5  |                          |                          | 7                        | 100                  | 5                         | 10                      | 25                     | 3                        |
| 7-15-61        | 10.2-10.5   | 42-48                | 9.2-11.2            | 9 - 10.5  | 3                        | 2                        |                          | 125                  |                           |                         | 20                     |                          |
| 7-16-61        | 9.9-10.6    | 46-53                | 8.8-12.0            | 10.3-10.5 | 1                        |                          |                          | 25                   |                           |                         | 30                     |                          |
| 7-17-61        | 10.2-10.6   | 45-53                | 8.8-12.8            | 10.3-10.5 | 2                        | 1                        |                          | 50                   |                           |                         |                        |                          |
| 7-18-61        | 10.4-10.6   | 48-51                | 8.8-10.2            | 10.5      | 2                        | 1                        |                          | 50                   |                           |                         |                        |                          |
| 7-19-61        | 10.4-10.5   | 48-53                | 8.0-8.6             | 10.5      | 1                        |                          |                          | 25                   |                           |                         |                        |                          |
| 7-20-61        | 10.5-10.6   | 45-52                | 9.2-10.6            | 8.5-10.5  | 1                        |                          | 1                        | 50                   |                           |                         | 31                     |                          |
| 7-21-61        | 10.6        | 55-62                | 8.8-10.6            | 10.5      |                          |                          |                          |                      |                           |                         |                        |                          |
| 7-22-61        | 10.5        | 60                   | 10.0                | 8         |                          |                          |                          |                      |                           |                         | 17                     |                          |
|                |             |                      |                     |           | 45                       | 19                       | 12                       | 1575                 | 17                        | 10                      | 212                    | 4                        |

BIT RECORD

| <u>No.</u> | <u>Size</u>        | <u>Make</u> | <u>Type</u> | <u>Jet<br/>Size</u> | <u>D e p t h</u> |           | <u>Feet</u> | <u>Hours</u>     |
|------------|--------------------|-------------|-------------|---------------------|------------------|-----------|-------------|------------------|
|            |                    |             |             |                     | <u>From</u>      | <u>To</u> |             |                  |
| 1          | 12 $\frac{1}{2}$ " | Security    | S3 Jet      | $\frac{1}{2}$ "     | 0                | 355       | 355         | 6 $\frac{1}{2}$  |
| 2          | 7-7/8"             | Reed        | 4T3-J       | $\frac{1}{2}$ "     | 355              | 3250      | 2895        | 29-3/4           |
| 3          | 7-7/8"             | Smith       | DT          | 11/16"              | 3250             | 3642      | 392         | 21 $\frac{1}{2}$ |
| 4          | 7-7/8"             | Hughes      | OSC-1G      | 11/16"              | 3642             | 3813      | 171         | 16 $\frac{1}{2}$ |
| 5          | 7-7/8"             | Hughes      | OSC-1G      | 11/16"              | 3813             | 3958      | 145         | 15 $\frac{1}{2}$ |
| 6          | 7-7/8"             | Hughes      | OSC-1G      | 11/16"              | 3958             | 4050      | 92          | 13 $\frac{1}{2}$ |
| 7          | 7-7/8"             | Hughes      | OSC         | 11/16"              | 4050             | 4160      | 110         | 18-3/4           |
| 8          | 7-7/8"             | Reed        | YS-1        | 11/16"              | 4160             | 4311      | 151         | 16               |
| 9          | 7-7/8"             | Smith       | K2P         | 11/16"              | 4311             | 4465      | 154         | 18 $\frac{1}{2}$ |
| 10         | 7-7/8"             | Hughes      | OWV         | 11/16"              | 4465             | 4558      | 93          | 12 $\frac{1}{2}$ |
| 11         | 7-7/8"             | Hughes      | OSC-1G      | 11/16"              | 4558             | 4743      | 185         | 24 $\frac{1}{2}$ |
| 12         | 7-7/8"             | Hughes      | OSC-1G      | 11/16"              | 4743             | 4843      | 100         | 16               |
| 13         | 7-7/8"             | Hughes      | OSC         | 11/16"              | 4843             | 4953      | 110         | 14-3/4           |
| 14         | 7-7/8"             | Smith       | DT2G        | 11/16"              | 4953             | 5096      | 143         | 19               |
| 15         | 7-7/8"             | Hughes      | OSC         | 11/16"              | 5096             | 5332      | 236         | 21 $\frac{1}{2}$ |
| 16         | 7-7/8"             | Hughes      | OSC         | 11/16"              | 5332             | 5516      | 184         | 21 $\frac{1}{2}$ |
| 17         | 7-7/8"             | Hughes      | OSC         | 11/16"              | 5516             | 5751      | 235         | 24 $\frac{1}{2}$ |
| 18         | 7-7/8"             | Hughes      | OSC         | 11/16"              | 5751             | 5832      | 81          | 7 $\frac{1}{2}$  |
| 19         | 7-7/8"             | Hughes      | OSC         | 11/16"              | 5832             | 5842      | Ream        | 3/4              |
|            |                    |             |             |                     | 5842             | 5876      | 34          | 3 $\frac{1}{2}$  |
|            |                    |             |             |                     | 5876             | 5897      | Ream        | 1                |
|            |                    |             |             |                     | 5897             | 6128      | 231         | 20 $\frac{1}{2}$ |

CORE HEAD RECORD

|     |        |       |         |           |      |      |    |                 |
|-----|--------|-------|---------|-----------|------|------|----|-----------------|
| CH1 | 6-1/8" | Truco | Diamond | 1/8 x 1/8 | 5832 | 5842 | 10 | 4               |
|     |        |       |         |           | 5876 | 5897 | 21 | 4 $\frac{1}{2}$ |

DRILLING EQUIPMENT

Contractor: Circle A Drilling Company (Rig #12)

Rig: Brewster N-45 Drawworks with 2 engine compound,  
1 pump drive to National C 150.

Power: 2 Waukesha WAKB Gas-Butane Engines  
165 HP each.

Pumps: 6-3/4" x 14" Oilwell 14PHD Powered by LRC Waukesha  
6"x 12" National C 150 (52 stroke)

Mast: 126' Lee C. Moore

Drill Pipe: 4 1/2" F.H.

Drill Collars: 3 5-3/4" W/4 1/2" H90, 8-5 1/2" w/4" H90

Pusher: B. B. Waddell

Drillers: B. A. Melin  
D. W. Dendy  
C. M. Stanford

DRILLING AND CORING TIME (Min/Ft)

|           |       |               |       |               |        |             |        |
|-----------|-------|---------------|-------|---------------|--------|-------------|--------|
| 500-1809  | 1/4   | 3487-3492     | 2-1/2 | 3799-3801     | 10     | 4007-4014   | 11     |
| 1809-2085 | 1/3   | 3492-3498     | 4-1/2 | 3801-3812     | 5      | 4014-4019   | 9      |
| 2085-2367 | 1/2   | 3498-3506     | 1-1/2 | 3812-3813     | 18     | 4019-4024   | 13-1/2 |
| 2367-2515 | 1/3   | 3506-3515     | 4     | Bit #5 OSC-1G |        | 4024-4030   | 8      |
| 2515-2535 | 1     | 3515-3525     | 3     | 3813-3823     | 1      | 4030-4032   | 12     |
| 2535-2613 | 1/2   | 3525-3559     | 3-1/2 | 3823-3828     | 1-1/2  | 4032-4035   | 13-1/2 |
| 2613-2830 | 1/4   | 3559-3568     | 4     | 3828-3831     | 2/3    | 4035-4037   | 9      |
| 2830-2976 | 1/2   | 3568-3603     | 3-1/2 | 3831-3832     | 2      | 4037-4040   | 13     |
| 2976-3006 | 3/4   | 3603-3621     | 12    | 3832-3834     | 6-1/2  | 4040-4042   | 7      |
| 3006-3010 | 1     | 3621-3624     | 6     | 3834-3839     | 3      | 4042-4050   | 15     |
| 3010-3024 | 1/2   | 3624-3627     | 14    | 3839-3854     | 4-1/2  | Bit #7 OSC  |        |
| 3024-3047 | 1-1/4 | 3627-3631     | 10    | 3854-3858     | 10     | 4050-4057   | 5      |
| 3047-3077 | 1     | 3631-3633     | 5     | 3858-3871     | 5      | 4057-4065   | 3-1/2  |
| 3077-3087 | 3/4   | 3633-3634     | 12    | 3871-3880     | 9      | 4063-407C   | 4      |
| 3087-3139 | 1     | 3634-3636     | 6-1/2 | 3880-3887     | 3-1/2  | 4070-4078   | 7      |
| 3139-3178 | 3/4   | 3636-3642     | 12    | 3887-3889     | 5      | 4078-4080   | 4-1/2  |
| 3178-3214 | 1     | Bit #4 OSC-1G |       | 3889-3897     | 8      | 4080-4083   | 12     |
| 3214-3230 | 3/4   | 3642-3662     | 6     | 3897-3900     | 5      | 4083-4090   | 5      |
| 3230-3250 | 1     | 3662-3686     | 4     | 3900-3903     | 10     | 4090-4092   | 8      |
| Bit #3 DT |       | 3686-3700     | 3     | 3903-3910     | 6      | 4092-4095   | 12     |
| 3250-3278 | 3/4   | 3709-3713     | 4     | 3910-3922     | 17     | 4095-4099   | 6      |
| 3278-3284 | 1-1/2 | 3713-3717     | 3     | 3922-3929     | 6      | 4099-4112   | 12-1/2 |
| 3284-3293 | 3/4   | 3717-3725     | 3-1/2 | 3929-3935     | 1-1/2  | 4112-4126   | 19     |
| 3293-3324 | 1/2   | 3725-3735     | 3     | 3935-3940     | 2-1/2  | 4126-4131   | 12-1/2 |
| 3324-3370 | 2     | 3735-3737     | 6     | 3940-3950     | 7-1/2  | 4131-4136   | 8      |
| 3370-3372 | 3     | 3737-3751     | 5     | 3950-3958     | 10     | 4136-4140   | 14     |
| 3372-3378 | 1     | 3751-3755     | 10    | Bit #6 OSC-1G |        | 4140-4147   | 9      |
| 3378-3419 | 2     | 3755-3764     | 4-1/2 | 3958-3970     | 4-1/2  | 4147-4150   | 14     |
| 3419-3422 | 1     | 3764-3769     | 11    | 3970-3982     | 5      | 4150-4153   | 8      |
| 3422-3449 | 2     | 3769-3770     | 4     | 3982-3986     | 8      | 4153-4160   | 14     |
| 3449-3452 | 1-1/2 | 3770-3772     | 1     | 3986-3993     | 5-1/2  | Bit #8 TS-1 |        |
| 3452-3461 | 2-1/2 | 3772-3777     | 3     | 3993-3995     | 11-1/2 | 4160-4169   | 7      |
| 3461-3466 | 2     | 3777-3781     | 8-1/2 | 3995-3998     | 9      | 4169-4183   | 4-1/2  |
| 3466-3484 | 2-1/2 | 3781-3788     | 6-1/2 | 3998-4002     | 7-1/2  | 4183-4187   | 7      |
| 3484-3487 | 3     | 3788-3799     | 14    | 4002-4007     | 4-1/2  | 4187-4193   | 4-1/2  |

DRILLING AND CORING TIME (Min/Ft) - Contd.

|            |        |                |        |                |       |              |        |
|------------|--------|----------------|--------|----------------|-------|--------------|--------|
| 4193-4206  | 7      | 4446-4452      | 5      | 4644-4652      | 6-1/2 | 4800-4812    | 9      |
| 4206-4211  | 4      | 4452-4465      | 12-1/2 | 4652-4658      | 3-1/2 | 4812-4815    | 6      |
| 4211-4224  | 7-1/2  | Bit #10 OWV    |        | 4658-4660      | 7     | 4815-4825    | 12     |
| 4224-4236  | 6      | 4465-4472      | 7-1/2  | 4660-4663      | 4-1/2 | 4825-4841    | 11     |
| 4236-4242  | 4-1/2  | 4472-4487      | 1-1/2  | 4663-4664      | 13    | 4841-4843    | 7-1/2  |
| 4242-4245  | 8      | 4487-4491      | 7-1/2  | 4664-4667      | 7     | Bit #13 OSC  |        |
| 4245-4252  | 5      | 4491-4494      | 2-1/2  | 4667-4672      | 5     | 4843-4846    | 3      |
| 4252-4260  | 7      | 4494-4498      | 5      | 4672-4680      | 7     | 4846-4850    | 4-1/2  |
| 4260-4267  | 4-1/2  | 4498-4501      | 3      | 4680-4684      | 4     | 4850-4860    | 7      |
| 4267-4275  | 7      | 4501-4507      | 6      | 4684-4686      | 7     | 4860-4863    | 2-1/2  |
| 4275-4280  | 8      | 4507-4516      | 1-1/2  | 4686-4690      | 3-1/2 | 4863-4874    | 5      |
| 4280-4283  | 10     | 4516-4523      | 11     | 4690-4704      | 9     | 4874-4879    | 4      |
| 4283-4285  | 7      | 4523-4526      | 7      | 4704-4705      | 1     | 4879-4883    | 5      |
| 4285-4288  | 10     | 4526-4534      | 10     | 4705-4706      | 8     | 4883-4892    | 9-1/2  |
| 4288-4293  | 8      | 4534-4536      | 1      | 4706-4708      | 3     | 4892-4896    | 5      |
| 4293-4305  | 6      | 4536-4541      | 14     | 4708-4711      | 6     | 4896-4904    | 11     |
| 4305-4310  | 9      | 4541-4543      | 1      | 4711-4716      | 8     | 4904-4908    | 9      |
| 4310-4311  | 16     | 4543-4545      | 4      | 4716-4718      | 4     | 4908-4911    | 7      |
| Bit #9 K2P |        | 4545-4552      | 13-1/2 | 4718-4724      | 8     | 4911-4918    | 10     |
| 4311-4319  | 5      | 4552-4554      | 14-1/2 | 4724-4731      | 10    | 4918-4920    | 7      |
| 4319-4324  | 3      | 4554-4558      | 23     | 4731-4734      | 5     | 4920-4922    | 4      |
| 4324-4328  | 4-1/2  | Bit #11 OSC-1G |        | 4734-4736      | 10    | 4922-4925    | 8      |
| 4328-4333  | 2      | 4558-4561      | 7      | 4736-4739      | 13    | 4925-4953    | 10     |
| 4333-4337  | 4      | 4561-4588      | 10     | 4739-4743      | 17    | Bit #14 DT2G |        |
| 4337-4347  | 7      | 4588-4590      | 17-1/2 | Bit #12 OSC-1G |       | 4953-4956    | 4      |
| 4337-4351  | 1-1/2  | 4590-4595      | 12     | 4743-4758      | 8     | 4956-4958    | 9      |
| 4351-4359  | 7      | 4595-4597      | 3-1/2  | 4758-4761      | 9-1/2 | 4958-4973    | 8-1/2  |
| 4359-4363  | 4      | 4597-4599      | 7      | 4761-4764      | 4     | 4973-4998    | 5-1/2  |
| 4363-4384  | 7      | 4599-4601      | 4      | 4764-4770      | 9     | 4998-5006    | 6      |
| 4384-4387  | 2      | 4601-4604      | 8      | 4770-4774      | 13    | 5006-5014    | 9      |
| 4387-4392  | 4      | 4604-4608      | 1-1/2  | 4774-4778      | 8     | 5014-5024    | 8-1/2  |
| 4392-4397  | 2      | 4608-4616      | 6      | 4778-4781      | 6     | 5024-5036    | 10     |
| 4397-4399  | 3-1/2  | 4616-4620      | 2      | 4781-4784      | 12    | 5036-5048    | 7-1/2  |
| 4399-4423  | 8      | 4620-4625      | 7      | 4784-4787      | 7     | 5048-5054    | 11     |
| 4423-4440  | 10-1/2 | 4625-4638      | 4      | 4787-4795      | 9     | 5054-5065    | 10-1/2 |
| 4440-4446  | 7-1/2  | 4638-4644      | 6      | 4795-4800      | 7     | 5065-5082    | 7-1/2  |

DRILLING AND CORING TIME (Min/Ft) - Contd.

|             |       |             |        |             |       |             |       |
|-------------|-------|-------------|--------|-------------|-------|-------------|-------|
| 5082-5085   | 5-1/2 | 5460-5461   | 2      | 5727-5751   | 11    | 5884-5885   | 12    |
| 5085-5096   | 10    | 5461-5464   | 7      | Bit #18 OSC |       | 5885-5886   | 10    |
| Bit #15 OSC |       | 5464-5471   | 6      | 5751-5808   | 5-1/2 | 5886-5887   | 17    |
| 5096-5098   | 6     | 5471-5475   | 4      | 5808-5811   | 3     | 5887-5888   | 12    |
| 5098-5163   | 2     | 5475-5479   | 8      | 5811-5816   | 6     | 5888-5889   | 13    |
| 5163-5189   | 3     | 5479-5481   | 4      | 5816-5818   | 3-1/2 | 5889-5890   | 10    |
| 5189-5193   | 2     | 5481-5495   | 7-1/2  | 5818-5820   | 6     | 5890-5891   | 11    |
| 5193-5229   | 3     | 5495-5500   | 12-1/2 | 5820-5826   | 5     | 5891-5892   | 16    |
| 5229-5237   | 5     | 5500-5513   | 11     | 5826-5830   | 4     | 5892-5893   | 15    |
| 5237-5243   | 9     | 5513-5516   | 14     | 5830-5832   | 2     | 5893-5894   | 15    |
| 5243-5249   | 15    | Bit #17 OSC |        | Core #1     |       | 5894-5895   | 12    |
| 5249-5254   | 12    | 5516-5531   | 7-1/2  | 5832-5833   | 19    | 5895-5896   | 16    |
| 5254-5258   | 11    | 5531-5535   | 5      | 5833-5834   | 23    | 5896-5897   | 29    |
| 5258-5277   | 9-1/2 | 5535-5544   | 6      | 5834-5835   | 17    | Bit #19 OSC |       |
| 5277-5305   | 7-1/2 | 5544-5550   | 7      | 5835-5836   | 16    | 5897-5910   | 2     |
| 5305-5308   | 10    | 5550-5565   | 2-1/2  | 5836-5837   | 17    | 5910-5914   | 6     |
| 5308-5332   | 8     | 5565-5568   | 5      | 5837-5838   | 30    | 5914-5919   | 2     |
| Bit #16 OSC |       | 5568-5574   | 8      | 5838-5839   | 30    | 5919-5921   | 9     |
| 5332-5337   | 8     | 5574-5577   | 5-1/2  | 5839-5840   | 22    | 5921-5923   | 2     |
| 5337-5365   | 5-1/2 | 5577-5580   | 3      | 5840-5841   | 20    | 5923-5931   | 3-1/2 |
| 5365-5375   | 6-1/2 | 5580-5585   | 6-1/2  | 5841-5842   | 20    | 5931-5942   | 4     |
| 5375-5389   | 5     | 5585-5588   | 4      | Bit #19 OSC |       | 5942-5946   | 2     |
| 5389-5394   | 4     | 5588-5595   | 7-1/2  | 5842-5848   | 6     | 5946-5958   | 3-1/2 |
| 5394-5411   | 5-1/2 | 5595-5597   | 3-1/2  | 5848-5851   | 5     | 5958-5969   | 6     |
| 5411-5416   | 7-1/2 | 5597-5616   | 5-1/2  | 5851-5871   | 7     | 5969-5975   | 4     |
| 5416-5421   | 2     | 5616-5620   | 9      | 5871-5875   | 5     | 5975-5995   | 5     |
| 5421-5434   | 6-1/2 | 5620-5624   | 7      | 5875-5876   | 2-1/2 | 5995-6028   | 6     |
| 5434-5436   | 2     | 5624-5640   | 4-1/2  | Core #2     |       | 6028-6052   | 4     |
| 5436-5437   | 6     | 5640-5642   | 7      | 5876-5877   | 31    | 6052-6066   | 5     |
| 5437-5438   | 2     | 5642-5648   | 4-1/2  | 5877-5878   | 30    | 6066-6086   | 6-1/2 |
| 5438-5445   | 6-1/2 | 5648-5656   | 5-1/2  | 5878-5879   | 18    | 6086-6098   | 6     |
| 5445-5448   | 3     | 5656-5665   | 2-1/2  | 5879-5880   | 12    | 6098-6128   | 5     |
| 5448-5449   | 8     | 5665-5674   | 4-1/2  | 5880-5881   | 14    |             |       |
| 5449-5451   | 3     | 5674-5696   | 7      | 5881-5882   | 19    |             |       |
| 5451-5456   | 8     | 5696-5714   | 4      | 5882-5883   | 10    |             |       |
| 5456-5460   | 5-1/2 | 5714-5727   | 5      | 5883-5884   | 11    |             |       |

FORMATION TOPS (Lane Wells Depths)

Cretaceous

|                 |      |         |
|-----------------|------|---------|
| Niobrara        | 1521 | (+ 802) |
| Greenhorn       | 2450 | (- 127) |
| Graneros        | 2660 | (- 337) |
| Newcastle       | 3000 | (- 667) |
| Skull Creek     | 3039 | (- 716) |
| Dakota (undif.) | 3197 | (- 874) |

Jurassic

|               |      |         |
|---------------|------|---------|
| Swift         | 3298 | (- 975) |
| Piper (undif) | 3574 | (-1251) |

Triassic

|           |      |         |
|-----------|------|---------|
| Spearfish | 3695 | (-1372) |
|-----------|------|---------|

Pennsylvanian

|           |      |         |
|-----------|------|---------|
| Minnelusa | 3735 | (-1412) |
|-----------|------|---------|

Mississippian

|                |      |         |
|----------------|------|---------|
| Charles        | 4399 | (-2076) |
| Mission Canyon | 4594 | (-2271) |
| Lodgepole      | 4891 | (-2568) |

Devonian

|              |      |         |
|--------------|------|---------|
| Three Forks  | 5260 | (-2937) |
| Nisku        | 5350 | (-3027) |
| Duperow      | 5398 | (-3075) |
| Souris River | 5491 | (-3168) |

Silurian

|           |      |         |
|-----------|------|---------|
| Interlake | 5592 | (-3269) |
|-----------|------|---------|

Ordovician

|                |      |         |
|----------------|------|---------|
| Gunton         | 5700 | (-3367) |
| Story Mountain | 5728 | (-3405) |
| Red River      | 5806 | (-3483) |

# SAMPLE DESCRIPTION

| <u>From</u> | <u>To</u> |                                                                                                                                            |
|-------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 1950        | - 1980    | <u>100% Sh</u> , lt gry, spkld wh, bndd, v fos, calc.                                                                                      |
| 1980        | - 2010    | a/a, w/incr. (50%) m-dk gry, satiny, v calc.                                                                                               |
| 2010        | - 2040    | a/a, tr ls, lt gry, dns, ptly dolo, silty                                                                                                  |
| 2040        | - 2070    | a/a, tr pyr, tr bent, lt gry.                                                                                                              |
| 2070        | - 2100    | <u>100% Sh</u> , m-dk gry, v sli calc, abund lse pyr, tr bent a/a                                                                          |
| 2100        | - 2130    | a/a, f slty.                                                                                                                               |
| 2130        | - 2160    | <u>100% Sh</u> , dk gry - blk, satiny, sli calc.                                                                                           |
| 2160        | - 2190    | <u>100% Sh</u> , lt-m gry, tr pyr, tr lt gry spkl, hvy tr gry grn bent.                                                                    |
| 2220        | - 2250    | a/a                                                                                                                                        |
| 2250        | - 2280    | a/a, tr pyr, tr ls, m gry, sli slty                                                                                                        |
| 2280        | - 2310    | <u>60% Sh</u> , a/a, <u>40% Ls</u> , m gry brn, shly, abund pyr.                                                                           |
| 2310        | - 2340    | <u>90% Sh</u> , m-dk gry, v sli calc, <u>10% Ls</u> , a/a, tr pyr.                                                                         |
| 2340        | - 2370    | a/a, w/tr spkld anhy.                                                                                                                      |
| 2370        | - 2400    | a/a, mostly m gry                                                                                                                          |
| 2400        | - 2430    | <u>100% Sh</u> , a/a, some dk gry - blk, tr ls a/a, tr ss, m gry.<br>vf gr, v slty, calc, abdt pyr, tr Inoc.                               |
| 2430        | - 2460    | <u>100% Sh</u> , m-dk gry, soft, v sli calc, tr ls a/a, tr pyr.                                                                            |
| 2460        | - 2490    | a/a                                                                                                                                        |
| 2490        | - 2520    | <u>60% Sh</u> , blk, blk, firm, calc, f wh spks, bldg gas, <u>40% Ls</u> ,<br>wh-v lt gry, dns - micro xln, dull yel flu, tr pyr, tr Inoc. |

SAMPLE DESCRIPTION - Contd.

| <u>From</u> | <u>To</u> |                                                                                              |
|-------------|-----------|----------------------------------------------------------------------------------------------|
| 2520 - 2535 |           | <u>60% Sh</u> , blk, blk, soft-hd, calc, pyr, <u>40% Ls</u> , a/a.                           |
| 2535 - 2550 |           | <u>60% Ls</u> , a/a, fos, <u>40% Sh</u> , a/a, some w/wh spks.                               |
| 2550 - 2580 |           | <u>100% Sh</u> , m gry - blk, wh spks, soft - firm, f carb, fos, calc, tr ls, lt-m gry, dns. |
| 2580 - 2610 |           | a/a, m gry - spkld, calc, soft, f carb, tr calc, tr Inoc, fos.                               |
| 2610 - 2640 |           | a/a, w/tr pyr, tr satin, lt - m gry.                                                         |
| 2640 - 2670 |           | <u>100% Sh</u> , m gry, spkld, calc, soft, f carb, tr Inoc, tr pyr.                          |
| 2670 - 2700 |           | <u>100% Sh</u> , a/a                                                                         |
| 2700 - 2730 |           | a/a, fairly silty                                                                            |
| 2730 - 2760 |           | a/a                                                                                          |
| 2760 - 2790 |           | a/a, bcmg less speckled, dk gry - blk in pt.                                                 |
| 2790 - 2820 |           | <u>100% Sh</u> , m - dk gry - blk, some spkl, calc - v sli calc                              |
| 2820 - 2850 |           | <u>100% Sh</u> , dk gy - blk, splintery, carb, and a/a                                       |
| 2850 - 2880 |           | a/a, try pyr                                                                                 |
| 2880 - 2910 |           | a/a                                                                                          |
| 2910 - 2940 |           | <u>100% Sh</u> , m - dk gry, blk, carb, v sli calc, hvy tr pyr                               |
| 2940 - 2970 |           | a/a, tr pyr, tr Inoc, tr ss, f gr, lt gry, calc.                                             |
| 2970 - 3000 |           | a/a                                                                                          |
| 3000 - 3030 |           | <u>100% Sh</u> , lt - m dk gry, w/some dk gry - blk a/a, tr pyr.                             |

SAMPLE DESCRIPTION - Contd.

| <u>From</u> | <u>To</u> |                                                                                              |
|-------------|-----------|----------------------------------------------------------------------------------------------|
| 3030 - 3060 |           | a/a, w hvy tr ss, wh - lt gry, vf gr, silty in pt, tite, friable                             |
| 3060 - 3090 |           | a/a, tr ss a/a, glauc in pt.                                                                 |
| 3090 - 3120 |           | <u>100% Sh</u> , m - dk gry, v sli calc, firm, tr bent.                                      |
| 3120 - 3150 |           | a/a, tr pyr.                                                                                 |
| 3150 - 3180 |           | a/a                                                                                          |
| 3180 - 3210 |           | a/a                                                                                          |
| 3210 - 3220 |           | a/a, tr Inoc.                                                                                |
| 3220 - 3230 |           | a/a                                                                                          |
| 3230 - 3240 |           | a/a                                                                                          |
| 3240 - 3250 |           | a/a                                                                                          |
| 3250 - 3270 |           | a/a                                                                                          |
| 3270 - 3280 |           | a/a, w/few pc ss, lt gry, f gr, tite, ns. (Kd?)                                              |
| 3280 - 3290 |           | a/a                                                                                          |
| 3290 - 3300 |           | <u>95% Sh</u> , a/a, soft, grn, <u>5% ss</u> , grn, v f gr, sli calc, glauc, tite            |
| 3300 - 3310 |           | a/a                                                                                          |
| 3310 - 3320 |           | <u>100% Sh</u> , a/a, tr ss, a/a                                                             |
| 3320 - 3330 |           | a/a, sndy & slty in pt, glauc, some gry grn                                                  |
| 3330 - 3340 |           | <u>95% Sh</u> , a/a, <u>5% Sltst</u> , grn, glauc in pt, calc, f sndy in pt (some gry grns?) |
| 3340 - 3350 |           | <u>95% Sh</u> , grn, lt gry grn - lt gry, <u>5% Sltst</u> , f sndy in pt.                    |

3270  
3210  
60

SAMPLE DESCRIPTION - Contd.

| <u>From</u> | <u>To</u> |                                                                               |
|-------------|-----------|-------------------------------------------------------------------------------|
| 3350        | - 3360    | a/a, w/tr wh cht w/pyr, tr bent, lt gry.                                      |
| 3360        | - 3370    | a/a, w/tr sh, rd brn.                                                         |
| 3370        | - 3380    | a/a                                                                           |
| 3380        | - 3390    | a/a                                                                           |
| 3390        | - 3400    | a/a                                                                           |
| 3400        | - 3410    | a/a, w/sltst, lt grn f sndy, glauc, some rd, sli calc.                        |
| 3410        | - 3420    | a/a, pred lt gry                                                              |
| 3420        | - 3430    | sh a/a, and sltst, rd brn, a/a                                                |
| 3430        | - 3440    | sh a/a, some rd brn sli calc, sltst, sndy, wh - v lt gry, glauc.              |
| 3440        | - 3450    | <u>100% Sh</u> , a/a                                                          |
| 3450        | - 3460    | <u>90% Sh</u> , lt grn, lt gry grn, lt gry, <u>10% sltst</u> , tr cht.        |
| 3460        | - 3470    | <u>90% Sltst</u> , f sndy, sli glauc, wh-lt grn, calc, <u>10% Ss</u> , silty. |
| 3470        | - 3480    | a/a, tr cht                                                                   |
| 3480        | - 3490    | <u>100% Sltst</u> , a/a                                                       |
| 3490        | - 3500    | <u>100% Sh</u> , lt gry, gry grn, rd brn.                                     |
| 3500        | - 3510    | a/a, tr sltst, lt grn - gry grn.                                              |
| 3510        | - 3520    | a/a, sndy in pt, pyr.                                                         |
| 3520        | - 3530    | <u>100% Sh</u> , mtld rd and gry.                                             |
| 3530        | - 3540    | a/a, lt gry & grn, mtld a/a                                                   |

SAMPLE DESCRIPTION - Contd.

| <u>From</u>                                                                                          | <u>To</u> |                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3540 - 3550                                                                                          |           | a/a, tr siltst, sndy, pyr.                                                                                                                                   |
| 3550 - 3560                                                                                          |           | a/a, siltst, rd, calc.                                                                                                                                       |
| 3560 - 3570                                                                                          |           | <u>100% Sh</u> , lt tan, tr siltst, rd, a/a                                                                                                                  |
| 3570 - 3580                                                                                          |           | a/a, tan - mtd lt gry - tan, some red                                                                                                                        |
| 3580 - 3590                                                                                          |           | <u>100% Sh</u> , lt gry grn - lt grn, spintry, tr rd siltst                                                                                                  |
| 3590 - 3600                                                                                          |           | a/a, some wh - lt gry siltst, sndy, calc.                                                                                                                    |
| 3600 - 3610                                                                                          |           | <u>100% Ls</u> , dol, wh - crwy, chlky, dns, firm, hd.                                                                                                       |
| 3610 - 3620                                                                                          |           | a/a, wh, crwy, lt gry mtd, chlky, soft-firm, tr varig sh.                                                                                                    |
| 3620 - 3630                                                                                          |           | a/a, lt tan - gry mtd in pt, micro xln in pt, soft-hd.                                                                                                       |
| 3630 - 3640                                                                                          |           | <u>100% Ls</u> , wh, crwy, chlky in pt, sli ool, soft-hd, tr org ch.                                                                                         |
| NOTE: Samples 1950 - 3640 described by A. Vitali.<br>Samples 3640 - 6125 described by T. D. Sheldon. |           |                                                                                                                                                              |
| 3640 - 3650                                                                                          |           | <u>100% Ls</u> , wh to lt yelsh gry, crpto xln, loc micromicaceous, chaulky in pt, soft to med hd, no por. <u>No shows</u> .                                 |
| 3650 - 3660                                                                                          |           | <u>90% Ls</u> , a/a, but some v f grained det mat, ang, pt shell frags(?), com calc vnltas; <u>10% Sh</u> , rdsh org to grysh rd, silt to clay size, gen blk |
| 3660 - 3670                                                                                          |           | <u>90% Ls</u> , a/a, but little det ls; <u>10% Sh</u> , a/a.                                                                                                 |
| 3670 - 3680                                                                                          |           | <u>90% Ls &amp; Dolic ls</u> , wh to grysh pk, micro to crypto xln, no vis por; <u>10% Sh</u> , a/a.                                                         |
| 3680 - 3690                                                                                          |           | <u>90% Dolic ls</u> , a/a; <u>10% Sh</u> , a/a; <u>Trc Anhy</u> , wh, micro xln, suc, prob secondary.                                                        |

SAMPLE DESCRIPTION - Contd.

| <u>From</u> | <u>To</u> |                                                                                                                                                                                            |
|-------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3690 - 3700 |           | <u>90% Dolic ls</u> , a/a, but loc mtld lt gry/grysh pk, grds to lmy dolo;<br><u>10% Sh</u> , a/a, inbd w/dolic ls. No shows.                                                              |
| 3700 - 3710 |           | <u>80% Sh</u> , pred rdsh org w/minor grsh rd, silt and clay size, gen blk; <u>20% Dolic ls</u> a/a; <u>Trc Anhy</u> , a/a                                                                 |
| 3710 - 3720 |           | <u>95% Sh</u> , a/a; <u>5% Anhy</u> , a/a; <u>Trc Dolic ls</u> a/a.                                                                                                                        |
| 3720 - 3730 |           | <u>90% Sh</u> , a/a; <u>5% Anhy</u> , a/a; <u>5% to Trc Dolic ls</u> , a/a but pt ool/frg                                                                                                  |
| 3730 - 3740 |           | a/a                                                                                                                                                                                        |
| 3740 - 3750 |           | a/a                                                                                                                                                                                        |
| 3750 - 3760 |           | <u>90% Sh</u> , a/a; <u>5% Anhy</u> a/a; <u>5% Ss</u> , rdsh org, f to vf, m sort, sli silty, sub rnd, pred qtz, carbonate cem, nil por                                                    |
| 3760 - 3770 |           | <u>70% Sh</u> , a/a; <u>5% Anhy</u> , a/a; <u>Trc Ss</u> , a/a; <u>25% Dolo</u> , lmy, rdsh org to pnksh gry to lt gry, prtly mtld micro to crpto xln, med hd, no vis por. <u>No shows</u> |
| 3770 - 3780 |           | <u>55% Ss</u> , a/a; <u>35% Dolo</u> , a/a; <u>10% Sh</u> , a/a; <u>Trc Anhy</u> a/a                                                                                                       |
| 3780 - 3790 |           | <u>90% Dolo</u> , a/a, but only loc lmy and pred lt yls gry to lt gry, mic xln, scat micro mica flakes, med hd, poor por; <u>10% Sh</u> , a/a; <u>Trc Anhy</u> a/a                         |
| 3790 - 3800 |           | <u>60% Dolo</u> , a/a, but some pl rd purp; <u>20% Ss</u> , a/a; <u>20% Sh</u> , a/a; <u>Trc Anhy</u> , a/a                                                                                |
| 3800 - 3810 |           | <u>90% Dolo</u> , a/a; <u>10% Sh</u> , a/a; <u>Trc Anhy</u> , a/a.                                                                                                                         |
| 3810 - 3820 |           | a/a                                                                                                                                                                                        |
| 3820 - 3830 |           | a/a                                                                                                                                                                                        |
| 3830 - 3840 |           | <u>30% Dolo</u> a/a; <u>60% Sh</u> a/a; <u>10% Ss</u> , a/a, but pred silty.                                                                                                               |
| 3840 - 3850 |           | <u>80% Ss</u> , wh, lt gry, grysh pk, rdsh org, pred vf, fri, f to m sort, qtz, sub rnd, calc cem, est up to 7% por. <u>20% Sh</u> , a/a. <u>Trc Dolo</u> , a/a. <u>No shows</u>           |
| 3850 - 3860 |           | <u>80% Sh</u> , dk gry, clay pred over silt, <u>10% Ss</u> , a/a<br><u>5% Sh</u> , rdsh org, a/a; <u>5% Dolo</u> , a/a. <u>Trc Anhy</u> a/a                                                |

SAMPLE DESCRIPTION - Contd.

From    To

3860 - 3870    75% Sh, dk gry, a/a; 10% Dolo, a/a; 10% Sh, rdsh org, a/a; 5% Ss, a/a; Trc Anhy, a/a

3870 - 3880    30% Sh, grnsh gry, splnty over blk, w/vf ss stks; 20% Sh, rdsh org, a/a; 20% Dolo, a/a; 20% Sh, dk gry, a/a; 10% Ss, grnsh gry, vf, silty, tt. No shows.

3880 - 3890    20% Sh, grnsh gry, a/a; 10% Sh, rdsh org a/a; Trc Sh dk gry a/a; 5% Ss, a/a; 65% Dolo, a/a, but much pl purp

3890 - 3900    35% Sh, rdsh org & grnsh gry a/a w/minor amts dk gry. 35% Dolo, a/a; 30% Ss, pred gry pk, vf, w sort, sub rnd carbonate cem, nil por. No shows.

3900 - 3910    50% Ss, a/a but about 10% rdsh org, up to 10% por (est) 35% Dolo, a/a, but trc p-pt vug por; 15% Sh, a/a

3910 - 3920    60% Dolo, a/a; 30% Sh, a/a; 10% Ss, a/a, Poor sample

3920 - 3930    70% Sh, a/a; varigated; 30% Dolo, a/a; Trc Ss, a/a. Poor sample

3930 - 3940    50% Dolo, a/a; 50% Sh, a/a. Poor sample

3940 - 3950    a/a, but Trc Ss, wh to grysh pk vf, w sort, carbonate cement, less than 5% est por.

3950 - 3960    a/a, but dk gry sh bcms nil

3960 - 3970    60% Dolo, a/a, but pred grysh org pk, some lt ylsch gry has p-pt vug por, some pl purp. 35% Sh, a/a. 5% Ss, a/a, but some frosting; Trc Anhy, wh suc, micro xln a/a. No shows.

3970 - 3980    85% Dolo, a/a; 15% Sh, a/a; Trc Anhy, wh, suc, a/a

3980 - 3990    85% Dolo, a/a, still pred gryish org pk; 10% Sh, a/a; 5% Ss, a/a

3990 - 4000    60% Dolo, a/a, 10% Sh, a/a; 30% Ss, wh to grysh pk, some org, pred vf, w sort, some f, m sort, fri, much frosting, carbonate cem, up to 10% por. No shows.

SAMPLE DESCRIPTION - Contd.

| <u>From</u> | <u>To</u> |                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4000 - 4010 |           | <u>80% Dolo</u> , a/a; <u>15% Sh</u> , a/a; <u>5% Ss</u> , a/a.                                                                                                                                                                                                                                                                                                    |
| 4010 - 4020 |           | <u>65% Dolo</u> , a/a; <u>35% Sh</u> , a/a; <u>Trc Ss</u> , a/a; <u>Trc Anhy</u> , wh, a/a.                                                                                                                                                                                                                                                                        |
| 4020 - 4030 |           | <u>50% Sh</u> , a/a, varigated; <u>45% Dolo</u> a/a; <u>Trc Ss</u> , a/a; <u>Trc Anhy</u> , a/a.                                                                                                                                                                                                                                                                   |
| 4030 - 4040 |           | <u>50% Sh</u> , a/a; 45% Dolo, a/a, but vf ss "floating", sli ool; <u>5% Anhy</u> , a/a.                                                                                                                                                                                                                                                                           |
| 4040 - 4050 |           | <u>80% Sh</u> , a/a, but approx $\frac{1}{2}$ grnsh gry, f jade looking grains imbedded in silt <u>20% Dolo</u> , a/a, but spastolithic texture common, qtz & mica impurities.                                                                                                                                                                                     |
| 4050 - 4060 |           | Prob a/a. Largely trip cvgs.                                                                                                                                                                                                                                                                                                                                       |
| 4060 - 4070 |           | a/a                                                                                                                                                                                                                                                                                                                                                                |
| 4070 - 4080 |           | <u>30% Sh</u> , pred dk gry, clay pred over silt; <u>10% Dolo</u> , a/a; <u>50% Ss</u> , pred wh w/some pnksh to grnsh gry, vf, w sort, qtz, sub ang to ang w/rexl, carbonate cem, loc pyr, grade to dolic (?) ss, 10% or less por, <u>1 piece had what appeared to be dead asphaltic stng - gave wk slo flu cut and wk flu ring on evap.</u> <u>V. Poor show.</u> |
| 4080 - 4090 |           | a/a, but no shows.                                                                                                                                                                                                                                                                                                                                                 |
| 4090 - 4100 |           | <u>15% Ss</u> , a/a, but gen silty; <u>40% Dolo</u> , a/a; <u>45% Sh</u> , a/a, reds v. minor. <u>Stg Trc Anhy</u> , a/a.                                                                                                                                                                                                                                          |
| 4100 - 4110 |           | <u>10% Ss</u> , a/a; <u>70% Sh</u> , dk gry a/a, only trc red & grn; <u>15% Dolo</u> , a/a                                                                                                                                                                                                                                                                         |
| 4120 - 4130 |           | a/a                                                                                                                                                                                                                                                                                                                                                                |
| 4130 - 4140 |           | <u>100% Sh</u> , dk gry, a/a; <u>Trc Ss</u> , ol gry, m-w sort, qtz.                                                                                                                                                                                                                                                                                               |
| 4140 - 4150 |           | a/a                                                                                                                                                                                                                                                                                                                                                                |
| 4150 - 4160 |           | <u>95% Sh</u> , varigated, grnsh gry, bri rdsh org, w/stks vf silty qtze ss w/nil por, nil dk gry sh. <u>5% Anhy</u> , v lt gry, crypto xln (primary) w/minor wh suc micro xln anhy (secondary).                                                                                                                                                                   |

SAMPLE DESCRIPTION - Contd

From   To

4160 - 4170                      a/a; largely trip cvgs

4170 - 4180                      a/a.

4180 - 4190                      80% Sh, grnsh gry, silt to clay, rdsh org stks, loc vf sdy; 10% Sh, rdsh org, silt to clay, loc vf ss stks; 10% Dolo, lt yel gry, mic xln, nil por. Trc Ss, grnsh gry grains w/minor qtz, tt.

4190 - 4200                      10% Ss, pred wh w/loc rdsh org stng, qtz, vf, w sort, carbonate cem; 10% Dolo lmy pred grsh org, some grys, micro xln, prtly suc, firm, nil por. 80% Sh, grysh grn, clay pred over silt, prtly waxy appearance, minor amts bri rdsh org and grysh blk, loc sdy stks and loc iron stng, a/a. No shows

4200 - 4210                      85% Sh, grnsh gry a/a, less than 5% reds; 5% Ss, a/a; 10% Dolo, a/a, but pred lt yel gry to wh

4210 - 4220                      a/a, but grnsh gry sh prtly (20%) bcng grnsh yel. and Ss prtly grnsh gry, loc silty    Dol prtly rexld to vf/f.

4220 - 4230                      a/a, but Sh now is about 20% rdsh org and 80% grnsh gry and grnsh yel. Dolo, pred micro xln suc, if not rexld to vf/f.

4230 - 4240                      a/a

4240 - 4250                      80% Sh, a/a; 15% Dolo, lmy, a/a, but iron stng loc; 5% Ss, a/a.

4250 - 4260                      80% Sh, a/a; 10% Dolo, a/a, but less iron stng; 10% Ls wh to ylsn gry, largely rexld, mtx crypto xln, f to m ol gry to ylsn gry calc xls compose 70 to 80% of frag; Trc Ss, a/a.

4260 - 4270                      a/a, but stg trc dk gry sh (cvgs?)

4270 - 4280                      70% Sh, a/a; 5% Ls a/a; 25% Dolo, 1/2 lt gry, pure, mic xln a/a and 1/2 dk grnsh gry mtld w/wh, mic xln, high clay content, etching with acid shows grnsh gry silt mtld w/wh ool lmy dolo.

4280 - 4290                      80% Sh, a/a; 15% Dolo, pred lt gry to ylsn gry, micro xln, nil amts mtld dolo, a/a.

SAMPLE DESCRIPTION - Contd.

From    To

4290 - 4300

a/a, but about 1/3 dolo mtld grnsh gry & wh a/a, and Trc Ss, wh, vf, w sort, firm, carbonate cem.

4300 - 4310

75% Sh, 3/4 grnsh gry a/a, about 1/4 rdsh org a/a; 5% Ss f/vf, M sort, fri, silic(?) cem, loc silty, prtly good por, up to 15% (?) 15% Dolo, a/a. 5% Anhy, wh, micro xln, suc.

4310 - 4320

75% Sh, a/a; 5% Ss, a/a; 5% Anhy, a/a; 5% Dolo, a/a. 10% Ls a/a in 4250-60 sample (1/2) and also mtld w/grnsh gry silt just as with dolo in 4270-80 sample.

4320 - 4330

a/a, but trc pyr noted in grnsh gry sh.

4330 - 4340

35% Ls, wh to ylish gry, micro xln suc to vf rexld, 65% Sh, a/a, but sh bcng less grn and more gry; Trc Anhy, a/a. Trc brach shells

4340 - 4350

a/a, but ls pred lt ol gry to ol gry mtld w/lt gry, prtly dolitized and rexld to vf g f micro xln. Trc SS, wh w/grng, fri, gen f/vf and w sorted, qtz, carbonate cem, fair por, loc silty.

4350 - 4360

30% Ls, a/a, but loc abdun ostracods; 65% Sh, a/a, more grnsh again; 5% Ss, a/a, pred f g.

4360 - 4370

85% Sh, a/a, 3/4 grnsh gry, 1/8 rdsh org, 1/8 pl purp, loc dolc(?) 5% Ss, a/a. 5% Anhy, a/a, wh, micro xln, suc. 5% Ls a/a, no fos, pred lt ylish gry.

4370 - 4380

a/a, but some ylish brn to ylish grn sh, prtly calc, still pred grnsh gry w/incrsing rdsh org, rdsh brn, and pl purp, rdsh brn shaker and sample bag stn 4370-4400.

4380 - 4390

a/a

4390 - 4400

a/a

4400 - 4410

70% Ls, pred v lt gry to wh, crypto xln to suc micro xln, firm, nil por 30% Sh, a/a, 1/2 grnsh gry and 1/2 rdsh brn. Redsh brn chert from 4400-4405.

SAMPLE DESCRIPTION - Contd.

From    To

4410 - 4420

60% Ls, a/a 40% Sh, a/a, 1/3 grnsh gry, 1/3 rdsh brown w/yel stns and stks, 1/3 mtld rdsh brn and grnsh gry. Mtlg also occurs with rdsh brn sh and ls.

4420 - 4430

70% Ls, wh, a/a; 30% Sh a/a but about 1/2 rdsh brn to rdsh org, still ptly mtld w/grnsh gry; Trc Anhy, wh, suc, a/a, apparently inbd w/rdsh sh

4430 - 4440

a/a, but ls prtly (10%) tinted rdsh org/rdsh brn.

4450 - 4460

80% Ls, a/a, but prtly rexld to vf xln, prt (30%) ol gry, appears rexld and also det in orig - no def fos, just rewkd ls; 20% Sh, a/a. No shows.

4460 - 4470

a/a

4470 - 4480

90% Ls, a/a, pred lt yls gry (cream), crypto xln to microxln suc, partly rexld, prtly dolc some lt ol gry (tan), rexld to f, micro xln mtx, looks ptly det in orig, stylites common. Nil por 10% Sh, a/a. Trc anhy, wh, a/a

4480 - 4490

a/a, but 1/3 ls has excellent matrix por est at 10 to 15%, prob all or part rexld, lt ol gry to yls gry, sucrosic, vf to micro xln, soft, no shows except for v weak slo flu cut - leaves v weak flu ring.

4490 - 4500

a/a, but wh metasomatic anhy w/ls, less than 5% fos hash and algal mat apparent, ls bcmg dolo w/sli pnksh cast. Shows a/a.

4500 - 4510

a/a, but less amt of por ls, pred lt y ls gry, a/a, appears lrgly det, indistinct algal outlines.

4510 - 4520

a/a, but 2/3 ls has excellent matrix por est at 10 to 15%, sim to 4480-90 sample, no shows except for v weak slo flu cut - leaves v wk flu ring.

4520 - 4530

a/a, but only 1/3 ls has matrix por a/a, 2/3 ls is lt yel gry. crypto xln, hd, nil por.

SAMPLE DESCRIPTION - Contd

From    To

- 4530 - 4540      a/a, but only trc of ls has matrix por; pred v lt gry to ylsb gry, crypto xln, hd, nil por
- 4540 - 4545      90% Ls, consisting of 10% suc, ylsb gry, micro xln, w/good inter xln por a/a, 40% crypto xln, lt gry, hd, nil por, poss sli argil 50% micro to crypto xln ylsb gry to ol gry, loc mtld, loc crs ol gry secd xls. Little, if any, evidence of det or fos material; 10% Sh, rdsh, a/a.
- 4545 - 4550      90% Ls, but more mtlg between lt ylsb gry and lt gry, both micro xln, suc; some rexld ls ol gry to f xln. Loc wh suc anhy filling some intr xln por. Trc anhy, wh, suc, micro xln, a/a. 10% Sh a/a, poss cvgs.
- 4550 - 4555      90% Ls(?) a/a, poor sample much rd, grn, and gry. Sh cavings (?) 10% Sh
- 4555 - 4560      Practically all trip cavings
- 4560 - 4565      a/a
- 4565 - 4570      10% Ls(?) a/a, but only ylsb gry, suc, micro xln, w/gd intrxln por 10% Sh a/a, cvgs(?) 80% Anhy, lt gry w/grnsh cast, micro to crypto xln, prtly suc, hd, stks wh secd suc microxln anhy.
- 4570 - 4575      100% Anhy, lt gry, a/a
- 4575 - 4580      a/a, but stg trc sec wh anhy a/a and 10% dolo lt ol gry
- 4580 - 4585      a/a
- 4585 - 4590      a/a, but some loc "smears" of pyr xls approx 1/100 mm in dia. w 10%, wh, secd, micro xln, prtly suc.
- 4590 - 4595      a/a
- 4595 - 4600      a/a, but trc vf/f xln, suc, f/gd intrxln por, dd o stn(?) alg frac planes pos v wk flu cut and trc microxln suc, ol gry dolo w/f intrxln por, no shows.
- 4600 - 4605      80% Dolic ls, 70% ol gry, micro xln, suc, gd intr xln por (est @ up to 10%) and fair p-pt vug por (in only pt of samples), soft, no shows 30% anhy, a/a, with nil por w/stk, sec anhy, 10% Ls, lt ylsb, micro xln,

SAMPLE DESCRIPTION - Contd.

From    To

|             |                                                                                                                                                                                       |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | prtlly suc, soft to med hd, f/p intrxln por. <u>10% Sh</u> a/a, poss all cvgs.                                                                                                        |
| 4605 - 4610 | <u>70% Ls</u> , a/a; <u>25% Dolic Ls</u> , a/a, but trc pl purp. <u>5% Sh</u> , a/a, prob cvgs (?)                                                                                    |
| 4610 - 4615 | <u>80% Dolic Ls</u> a/a; <u>20% Ls</u> , a/a                                                                                                                                          |
| 4615 - 4620 | <u>100% Dolic Ls</u> , a/a, about 1/2 show excel intr xln por and f/g p-pt<br>7-10% vug por some anhy, wh, sec, infilling <u>v faint flu cut - leaves</u><br><u>wk flu ring</u> .     |
| 4620 - 4625 | <u>90% Dolic Ls</u> , a/a; <u>10% Anhy</u> , lt gry, micro xln, suc. Trc to 5% Sh, rdsh brn, a/a                                                                                      |
| 4625 - 4630 | a/a                                                                                                                                                                                   |
| 4630 - 4635 | a/a                                                                                                                                                                                   |
| 4635 - 4640 | a/a                                                                                                                                                                                   |
| 4640 - 4645 | a/a                                                                                                                                                                                   |
| 4645 - 4650 | a/a                                                                                                                                                                                   |
| 4650 - 4655 | a/a                                                                                                                                                                                   |
| 4655 - 4660 | a/a                                                                                                                                                                                   |
| 4660 - 4665 | a/a                                                                                                                                                                                   |
| 4665 - 4670 | a/a                                                                                                                                                                                   |
| 4670 - 4675 | <u>100% Ls</u> , ylsch gry, 20%/40% M/VC det mat, fos frags inclg bry, brach, algal(?) coral(?) mtx, micro xln, suc, prtlly rexld, 5 to 10% ool, ls, 3 to 7% intrxln por, s ft/md hd. |
| 4675 - 4680 | a/a                                                                                                                                                                                   |

SAMPLE DESCRIPTION - Contd

| <u>From</u> | <u>To</u> |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4680 - 4685 |           | a/a                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4685 - 4690 |           | a/a                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4690 - 4695 |           | a/a                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4695 - 4700 |           | a/a                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4700 - 4705 |           | a/a                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4705 - 4710 |           | a/a                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4710 - 4715 |           | a/a, <u>but dk gry stylolites give strmg flu cut</u>                                                                                                                                                                                                                                                                                                                                                                                               |
| 4715 - 4720 |           | a/a, some v crs sec calc xls apparent.                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4720 - 4725 |           | a/a                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4725 - 4730 |           | <u>100% Ls, 30% lt yls gry, micro xln, suc, approx 25% rexld w/ ave xl size abt 1/50 mm, appears to have good intrxln por but nil perm, some blk stylolites which have brnsh blk dead o stng assoc w/them, gives strmg cut; 70% lt yls gry to lt ol gry, 60 to 70% micro xln mtx w/ 30 to 40% vf to crs det mat, partly fos det, med hd, intrxln por poor due prtly to infilling by wh secd anhy, no shows. V crs sec calc ol gry xls present.</u> |
| 4730 - 4735 |           | a/a                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4735 - 4740 |           | a/a                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4740 - 4745 |           | trip cvgs                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 4745 - 4750 |           | trip cvgs                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 4750 - 4755 |           | <u>90% Ls and Lmy Dolo, 30% lt yls gry, micro xln, prtly suc, sli dolc to lmy dolo, lrgly rexld, p/f intrxln por, nil perm; 70% lt gry to ol gry, dolo to dolc, 50% to 75% microxln mtx w/25% to 50% vf to crs det mat, sli argil content, unident fos frags, prtly replaced by anhy, gen poor por and nil perm 10% Anhy 1/2 primary, lt gry, micro xln, 1/2 secdy, wh, micro xln, suc.</u>                                                        |

SAMPLE DESCRIPTION - Contd.

From    To

|             |                                                                                                                                                                                                              |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4755 - 4760 | a/a, incr in amt of anhy, prim, poss up to 50% before washing.                                                                                                                                               |
| 4760 - 4765 | a/a less dolic mat and decrease in amt of det ls, much anhy on shaker                                                                                                                                        |
| 4765 - 4770 | <u>95% Lmy Dolo and Dolic Ls</u> , pred ylsb gry, micro xln suc, vf to f fos frag pred algal, vf sec xls (lt ol gry, scat), poor por - much anhy reducing por. 5% Anhy, wh, microxln; secdy. <u>No shows</u> |
| 4770 - 4775 | a/a but pred lmy dolo, trc p-pt vug por, <u>no shows</u> .                                                                                                                                                   |
| 4775 - 4780 | a/a but secdy anhy mtld w/dk gry silt.                                                                                                                                                                       |
| 4780 - 4785 | a/a but bcng pred dolic ls                                                                                                                                                                                   |
| 4785 - 4790 | a/a but trc vug por w/vugs up to 1/4 mm in dia and depth, 1/3 of carbonate replaced by wh suc anhy.                                                                                                          |
| 4790 - 4795 | a/a                                                                                                                                                                                                          |
| 4795- 4800  | a/a, but 10% dolic ls, exhibits <u>good intr xln por</u> and p-pt vug por, suc, micro xln w/about 10% replacement and infilling by anhy. Trc lt gry prim anhy and gry sh - poss cvgs. No shows.              |
| 4800 - 4805 | a/a, but 1/3 dolic ls, ool, f, with micro xln mtx, det carbonate 2/3 as before. P-pt vug por v minor                                                                                                         |
| 4805 - 4810 | a/a, but incring amt pure ls, decr to nil of ool carbonate; much soft wh anhy m sample, most prob washed away, poss 50% or higher anhy before washing. Some p-pt vug por, abt 20% anhy filled.               |
| 4810 - 4815 | a/a                                                                                                                                                                                                          |
| 4815 - 4820 | a/a, but 1/3 dolic ls is ool to pelletoidal up to 1/2 mm in dia, prtly infilled w/anhy, est por at 7 to 12%. <u>No shows</u> Trc grnsh gry sh                                                                |
| 4820 - 4825 | <u>85% Dolic ls</u> , 2/3 dk grnsh gry, argil, prtly rexld, micro xln/crypto xln no por 1/3 dolic ls, ylsb gry a/a. 15% Shale, grnsh gry, splnt, med hd                                                      |

SAMPLE DESCRIPTION - Contd

From   To

4825 - 4830

a/a, but dolic ls pred, some lt grys, lrgly rexld, micro xln, appears det in orig, loc dk "mtld" w/lt, (appears to be about 10 to 20 fos det material in argil ls), brachs, algal tubes, worm (?) tubes. Still about 15 to 20% ylsb gry ls a/a.

4830 - 4835

90% Dolic Ls and Ls; 30% ool/pell, F/M, micro xln, ylsb gry/lt ol gry, no por due to filling of space between oolites by calcite and/or micro xln dolic ls; 30% ylsb gry det ls, ylsb gry a/a, with up to 30% f calc xls imbedded in micro xln mtx; 40% grysh grn dolic ls a/a, 10 to 25% fos. 10% Sh. a/a

4835 - 4840

100% Ls to Lmy Dolo, wh to lt ylsb gry, micro xln w/f/crs fos det mat incl brach algal material, some ool or pell (lt ol gry, a/a), minor p-pt vug por, much anhy filling, gen nil por thru out. No shows.

4840 - 4845

Trip cvgs

4845 - 4850

Trip cvgs

4850 - 4855

100% Ls to Lmy Dolo, 60% lt gry, micro xln, pred suc, 30% or more rexld, vf calc xls, prtly replaced by wh anhy, nil por; 10% ol gry, micro xln, suc, nearly all rexld to lmy dolo, good intr xln por; 30% lt ylsb gry to ylsb gry, f det w/some fos frags, with micro xln mtx and pell with micro xln cem, sim to ab, nil por, prtly rexld and prtly replaced by anhy Trc anhy, wh, micro xln, suc, mtld w/grnsh gry sh.

4855 - 4860

a/a

4860 - 4865

a/a, but only trc d gry por

4865 - 4870

a/a, but nearly equal amts lt gry suc rexld ls and ylsb gry pell ls, pell very irreg, no por.

4870 - 4875

100% Ls, pred ylsb gry w/pink cast, pell ls a/a but some inter pell por where not cem., some (10%) lt gry dolic ls a/a, trc wh anhy a/a

4875 - 4880

a/a but no lt gry dolic ls

SAMPLE DESCRIPTION - Contd

From   To

|             |                                                                                                                                                                                                                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4880 - 4885 | a/a                                                                                                                                                                                                                                                                                       |
| 4885 - 4890 | a/a                                                                                                                                                                                                                                                                                       |
| 4890 - 4895 | a/a                                                                                                                                                                                                                                                                                       |
| 4895 - 4900 | <u>100% Ls and Dolic Ls</u> ; 40% ol gry, micro xln, dolic ls to lmy dolo fair inter xln por est @ 5 to 7%, lrgly rexld, suc, no shows; 35% ylsb gry pell ls a/a; 25% gry/lt gry, lrgly rexld, micro xln mtx, appears det in origin, partly wh fos det (ghosts) in gry argil ls, nil por. |
| 4900 - 4905 | <u>100% Ls and Dolic Ls</u> , 20% lt ol gry a/a; 10% ylsb gry pell ls a/a<br>70% gry/lt gry ls a/a                                                                                                                                                                                        |
| 4905 - 4910 | <u>100% Ls</u> , gry/lt gry, a/a, only trc lt ol gry and ylsb gry pell ls a/a, trc metas anhy                                                                                                                                                                                             |
| 4910 - 4915 | a/a, much v crs det mat incl brach frags, some worm (?) tubes                                                                                                                                                                                                                             |
| 4915 - 4920 | a/a                                                                                                                                                                                                                                                                                       |
| 4920 - 4925 | a/a                                                                                                                                                                                                                                                                                       |
| 4925 - 4930 | a/a, poor sample, much cvgs                                                                                                                                                                                                                                                               |
| 4930 - 4935 | a/a, but more rexld to crs xln                                                                                                                                                                                                                                                            |
| 4935 - 4940 | a/a, but pred lt gry (due to incr of fos det(?))                                                                                                                                                                                                                                          |
| 4940 - 4945 | a/a, sample quality good - few cvgs                                                                                                                                                                                                                                                       |
| 4945 - 4950 | a/a                                                                                                                                                                                                                                                                                       |
| 4950 - 4955 | trip cvgs                                                                                                                                                                                                                                                                                 |
| 4955 - 4960 | trip cvgs                                                                                                                                                                                                                                                                                 |
| 4960 - 4965 | <u>100% Ls</u> , gry/lt gry a/a, still mtld and wh ghosts due to fos frags, ind brach & cri det, to crs rexld vf to v crs                                                                                                                                                                 |

SAMPLE DESCRIPTION - Contd

From   To

|             |                                                                                                                                                                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4965 - 4970 | a/a, trc lt gry, micro xln, suc, w/poor intr xln por.                                                                                                                                                                                                     |
| 4970 - 4975 | a/a, but trc of dk gry argil stks, loc mtd w/ls                                                                                                                                                                                                           |
| 4975 - 4980 | a/a but 10% ls has pnksh or rdsh org cast, trc redsh org cly stks                                                                                                                                                                                         |
| 4980 - 4985 | a/a but 1 piece had dead blk resid oil which gave poor strmg cut, trc metas anhy, wh, micro xln                                                                                                                                                           |
| 4985 - 4990 | a/a, but incr amt of dk gry sh a/a, up to 10%, pnks and rdsh org out                                                                                                                                                                                      |
| 4990 - 4995 | a/a                                                                                                                                                                                                                                                       |
| 4995 - 5000 | a/a, but trc micro xln pyr clusters                                                                                                                                                                                                                       |
| 5000 - 5005 | a/a                                                                                                                                                                                                                                                       |
| 5005 - 5010 | a/a                                                                                                                                                                                                                                                       |
| 5010 - 5015 | a/a, but dk gry sh decr to 5%                                                                                                                                                                                                                             |
| 5015 - 5020 | <u>100% Ls</u> ; 2/3 lt gry/gry a/a, 1/3 lt ylsh gry (cream) to lt gry lt ol gry (tan), w/sli pnksh cast, micro xln mtx prtly suc, 80% det w/ much fos mat incl crs/v crs brach and cri frags, prtly f rexln, nil amts of argil mat, trc poor intrxln por |
| 5020 - 5025 | a/a but all clean ls a/a, lt ylsh gry to lt ol gry.                                                                                                                                                                                                       |
| 5025 - 5030 | a/a                                                                                                                                                                                                                                                       |
| 5030 - 5035 | a/a but 15% ool/pell about 1/2 mm ave dia, pell md lt gry                                                                                                                                                                                                 |
| 5035 - 5040 | a/a but pell/ool ls incr to 25% of sample                                                                                                                                                                                                                 |
| 5040 - 5045 | a/a                                                                                                                                                                                                                                                       |
| 5045 - 5050 | a/a                                                                                                                                                                                                                                                       |

SAMPLE DESCRIPTION - Contd

|             |                                                                                                                                                                                      |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5050 - 5055 | a/a                                                                                                                                                                                  |
| 5055 - 5060 | a/a                                                                                                                                                                                  |
| 5060 - 5065 | a/a                                                                                                                                                                                  |
| 5065 - 5070 | a/a, but trc md gry argil ls                                                                                                                                                         |
| 5070 - 5075 | a/a, but trc wh metas anhy, some filling intr lin por                                                                                                                                |
| 5075 - 5080 | a/a                                                                                                                                                                                  |
| 5080 - 5085 | a/a                                                                                                                                                                                  |
| 5090 - 5095 | a/a                                                                                                                                                                                  |
| 5095 - 5100 | trip cvgs                                                                                                                                                                            |
| 5100 - 5105 | trip cvgs                                                                                                                                                                            |
| 5105 - 5110 | trip cvgs                                                                                                                                                                            |
| 5110 - 5115 | trip cvgs                                                                                                                                                                            |
| 5115 - 5120 | 100% ls, 2/3 a/a, 1/3 ylsb gry, micro xln, prtly suc, md to crs<br>pell, some ool, rnd to elong, loc f/vf rexln up to 15%, excel por<br>(up to 20%), trc fos frag, <u>no shows</u> . |
| 5120 - 5125 | a/a, but 30% det ls mixed with pell a/a, fair to good por                                                                                                                            |
| 5125 - 5130 | a/a, but 2/3 pell ls a/a and 1/3 f/md det ls, a/a, micro xln,<br>partly suc, lt ylsb gry to ylsb gry, up to 30% vf rexld, some intr xln<br>por, questionable fos frags               |
| 5130 - 5135 | a/a, but 3/4 pell/ool ls                                                                                                                                                             |
| 5135 - 5140 | a/a, but 90% pell/ool ls                                                                                                                                                             |
| 5140 - 5150 | a/a                                                                                                                                                                                  |

SAMPLE DESCRIPTION - Contd

| <u>From</u> | <u>To</u> |                                                                                                 |
|-------------|-----------|-------------------------------------------------------------------------------------------------|
| 5150 - 5160 |           | a/a                                                                                             |
| 5160 - 5165 |           | a/a                                                                                             |
| 5165 - 5170 |           | a/a, but 80% pell/ool ls, 20% det ls                                                            |
| 5170 - 5175 |           | a/a                                                                                             |
| 5175 - 5180 |           | a/a                                                                                             |
| 5180 - 5185 |           | a/a                                                                                             |
| 5185 - 5190 |           | a/a                                                                                             |
| 5190 - 5195 |           | a/a                                                                                             |
| 5195 - 5200 |           | a/a, but 2/3 pell/ool ls w/ave dia of 1/4 mm and 1/3 det ls a/a<br>w/f intrxln and p-pt vug por |
| 5200 - 5205 |           | a/a                                                                                             |
| 5205 - 5210 |           | a/a, but 1/2 pell/ool ls                                                                        |
| 5210 - 5215 |           | a/a, but 1/3 pell/ool ls, 2/3 det suc ls                                                        |
| 5215 - 5220 |           | a/a, but 1/4 pell/ool ls, 3/4 det ls                                                            |
| 5220 - 5225 |           | a/a                                                                                             |
| 5225 - 5230 |           | a/a                                                                                             |
| 5230 - 5235 |           | a/a, but 90% det suc ls, 10% pell ool ls                                                        |
| 5235 - 5240 |           | a/a                                                                                             |
| 5240 - 5245 |           | a/a                                                                                             |

SAMPLE DESCRIPTION - Contd

| <u>From</u> | <u>To</u> |                                                                                                                                                                                                                                                                                              |
|-------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5245 - 5250 |           | a/a, but trc v lt gry crypto xln cht, trc of micro pyr xls, trc lt gry, micro xln, suc ls, 80% rexld vf/f, trc argil impur.                                                                                                                                                                  |
| 5250 - 5255 |           | a/a, but 2/3 det and ool ls and 1/3 lt gry to lt ol gry dolic ls, micro xln to vf xln, nearly all rexld, trc argil impur, strg <u>trc</u> v lt gry cht a/a. <u>Trc sh</u> , grn gry                                                                                                          |
| 5255 - 5260 |           | <u>80% Argil Dolo</u> , grnsh gry, micro/crypto xln, dns, <u>20% Dolic Sh</u> , grnsh gry, splint, trc blk and pl rd purp. over 1/2 sample Lodgepole ls a/a - poor sample                                                                                                                    |
| 5260 - 5265 |           | a/a, but 60% Dolic Sh, 40% Argil Dolo, and vf/f rnd grn pell of dolic sh "floating" in lt gry dolic sh.                                                                                                                                                                                      |
| 5265 - 5270 |           | a/a, but stg trc dk rdsh brn sh                                                                                                                                                                                                                                                              |
| 5270 - 5275 |           | a/a, but trc of bri mod rd sh as well a/a                                                                                                                                                                                                                                                    |
| 5275 - 5280 |           | a/a, but stg trc of grn pell ls cem by lt gry dolo                                                                                                                                                                                                                                           |
| 5280 - 5285 |           | a/a, but stg trc of blk/gry sh blk sh, splnt                                                                                                                                                                                                                                                 |
| 5285 - 5290 |           | a/a, but abund fish scales, trc f/vf sub rnd qtz gr "floating" in grnsh gry dolic sh, incr amt of rdsh sh up to 35%                                                                                                                                                                          |
| 5290 - 5295 |           | a/a, but decr amt of rdsh sh to 5%, trc f/vf well sort qtz ss w/f grn pell a/a                                                                                                                                                                                                               |
| 5295 - 5300 |           | No sample                                                                                                                                                                                                                                                                                    |
| 5300 - 5305 |           | <u>30% Sh</u> , grysh blk, cly/slt; <u>5% Ss</u> , a/a; <u>30% Dolic Sh</u> and <u>Argil Dolo</u> , grnsh gry, a/a; 35% Sh, mod rd to rdsh brn, prtly mtld w/lt gry suc micro xln dolo. Trc mod yel to mod grnsh yel prtly mtld w/lt gry dolic sltst.                                        |
| 5305 - 5310 |           | <u>90% Sh</u> ; 70% grnsh gry, v dolic, a/a, 25% lt bri rd, pl to dk rdsh brn, dolic, 5% grnsh yel, dolic, trc dk gry a/a. <u>5% Dolo</u> , pred ol gry, micro xln, suc, argil. <u>5% Ss</u> , lt gry, pred vf g silty, qtz w/grn g, poor sorting, occurs as stks in grnsh gry dolic sh, tt. |

SAMPLE DESCRIPTION - Contd

| <u>From</u> | <u>To</u> |                                                                                                                                                                                                                                                                            |
|-------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5310 - 5315 |           | a/a, but trc micro xln pyr clus, trc vlt gry crypto xln ls w/vf g grnsh gry sh pell "floating".                                                                                                                                                                            |
| 5315 - 5320 |           | a/a, but no ls, trc pl purp sh                                                                                                                                                                                                                                             |
| 5320 - 5325 |           | a/a, but argil dolo bcmg more lmy                                                                                                                                                                                                                                          |
| 5325 - 5330 |           | a/a, but stg trc dk gry pyritic sh                                                                                                                                                                                                                                         |
| 5330 - 5335 |           | a/a, but prob lrgly trip cvgs                                                                                                                                                                                                                                              |
| 5335 - 5340 |           | a/a                                                                                                                                                                                                                                                                        |
| 5340 - 5345 |           | <u>90% Sh</u> , 20% grnsh gry a/a, 40% dk gry a/a, 40% rdsh brn, mod red, pl purp a/a prbly mtld w/lt gry dolc sh; <u>10% Dolo</u> , ol gry, lt gry, ylsb gry, pred micro xln, lrgly suc, trc poor intr xln por; <u>Trc Ss</u> , a/a, but some pl rd, silty, tt, calc cem. |
| 5345 - 5350 |           | a/a, but Sh 80% grnsh gry, 20% rdsh brn                                                                                                                                                                                                                                    |
| 5350 - 5355 |           | a/a, but ol gry dolo incr to 20%, 10% of dolo altered to wh micro xln suc anhy.                                                                                                                                                                                            |
| 5355 - 5360 |           | 30% Sh, equal amts rds and grns, loc mtld; 40% Dolo, ol gry a/a; <u>40% Ls</u> , brnsh gry to ylsb gry, loc mtld, brnsh gry crpto xln, ylsb gry, micro xln, sli dolc 20 to 30% rexld. <u>Trc wh suc anhy</u> a/a                                                           |
| 5360 - 5365 |           | <u>60% Ls</u> , a/a, <u>20% Dolo</u> , a/a, but v lmy, <u>20% Sh</u> a/a                                                                                                                                                                                                   |
| 5365 - 5370 |           | 90% Ls a/a, 10% Dolo, a/a                                                                                                                                                                                                                                                  |
| 5370 - 5375 |           | a/a, but 10 to 20% vf rexld                                                                                                                                                                                                                                                |
| 5375 - 5380 |           | a/a                                                                                                                                                                                                                                                                        |
| 5380 - 5385 |           | <u>100% Ls</u> , a/a, but 90% lt ol gry to ylsb gry, 80% rexld up to vf xln, trc p-pt vug por, some poor intr xln por.                                                                                                                                                     |

SAMPLE DESCRIPTION - Contd

From   To

|             |                                                                                                                                                                                      |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5385 - 5390 | a/a, but occ fracs noted, trc good intr xln por                                                                                                                                      |
| 5390 - 5395 | a/a, but less than 50% rexld                                                                                                                                                         |
| 5395 - 5400 | a/a, but sev stylolites, indistinct algal(?) outlines                                                                                                                                |
| 5400 - 5405 | a/a, but 5% F/v crs ol gry xls in ylsb gry micro xln mtx, abt 70% rexld                                                                                                              |
| 5405 - 5410 | a/a, but sli trc por p-pt vug por                                                                                                                                                    |
| 5410 - 5415 | a/a                                                                                                                                                                                  |
| 5415 - 5420 | a/a, but 5% f det micro xln, argil stk and pell, occ pell.                                                                                                                           |
| 5420 - 5425 | <u>100% Ls</u> , 90%, ylsb gry, crpto/micro xln, less than 5% rexld, nil por;<br>10% ol gry, lrgly rexld a/a, stks wh suc anhy a/a                                                   |
| 5425 - 5430 | a/a but trc md gry and brnsh gry micro xln ls; <u>trc</u> micro xln suc v lt<br>gry <u>lmy dolo</u> , with fair intr xln por                                                         |
| 5430 - 5435 | <u>30% Dolo</u> , lmy, v lt gry, micro xln, suc, soft, fair to good intrxln por<br>est at 7 to 10%. <u>70% Ls</u> , 1/3 ylsb gry, 2/3 ol gry, ave 35 to 40% rexld,<br>micro xln pred |
| 5435 - 5440 | a/a, but <u>20% Dolo</u> a/a, <u>80% Ls</u> a/a                                                                                                                                      |
| 5440 - 5445 | a/a, but <u>15% Dolo</u> a/a, <u>85% Ls</u> a/a                                                                                                                                      |
| 5445 - 5450 | a/a, but 5% crs/v crs ol gry xls in rexld ls                                                                                                                                         |
| 5450 - 5455 | a/a, but <u>40%</u> suc <u>Dolo</u> a/a, <u>60% Ls</u> , a/a, but dolo bcmg lt ol gry and stks<br>of wh suc anhy in 5% of ls                                                         |
| 5455 - 5460 | a/a, but <u>60% Dolo</u> , a/a, <u>40% Ls</u> a/a                                                                                                                                    |
| 5460 - 5465 | a/a, but 10% Ls rexld to micro xln w/fair intr xln por                                                                                                                               |
| 5465 - 5470 | a/a, but 40% Dolo a/a, 60% Ls a/a, ls has only trc intrxln por                                                                                                                       |

SAMPLE DESCRIPTION - Contd

From    To

|             |                                                                                                                                                                                                                                                                               |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5470 - 5475 | a/a, but 25% Dolo a/a, 75% Ls a/a                                                                                                                                                                                                                                             |
| 5475 - 5480 | a/a, but 35% Dolo, but 1/3 has nil por w/10% anhy replacement.                                                                                                                                                                                                                |
| 5480 - 5485 | 100% Dolic ls, 1/3 ol gry, crypto xln, prtly micro xln 1/3 md gry mtld w/ylsh gry, argil, micro xln prtly rexld, dolic 1/3 ylsh gry, micro xln, 70 to 90% f/micro rexld, gen suc, stks sec, anhy a/a, gen nil por.<br>Trc Dolo, a/a                                           |
| 5485 - 5490 | a/a but stg trc dolo a/a                                                                                                                                                                                                                                                      |
| 5490 - 5495 | a/a but 25% dolo a/a, ol gry, suc, f/g intr xln por, (est @ about 10%)<br>Trc dk gry Sh                                                                                                                                                                                       |
| 5495 - 5500 | <u>60% Lmy Ss to Sdy Det, ls</u> v lt gry to lt ylsh gry, vf/crs, poorly sorted, ls cem comp from 40% to 80%, cem micro xln, round qtz pebbles, blk and red chert rounded to angular, 80 to 90% rexld, trc lrg fos frags incl brachs. 10%, <u>Dolo a/a</u> 30% <u>Ls, a/a</u> |
| 5500 - 5505 | a/a, but trc bri red stng on wh qtz ss well rnd, sil cem(?), nil reaction in HCl.                                                                                                                                                                                             |
| 5505 - 5510 | a/a, but dk gry fos that could be either plant or animal, have appearance of pelc or brach valves, but overlap, up to 1/2 mm long, 1/64 mm thick, and 1/6 mm in depth. Det ls, a/a, decr amts of sd, nil por                                                                  |
| 5510 - 5515 | <u>55% Sdy Det Ls a/a; 35% Ls</u> , brnsh gr to ol gry dolic crypto xln, dns, 20% ave micro rexld. 10% Dolo, brnsh gry, micro xln, suc, poor intrxln por, apparently from ls a/a via dolztn. Still trc fos fnd in previous sample                                             |
| 5515 - 5520 | a/a, pred trip cvgs                                                                                                                                                                                                                                                           |
| 5520 - 5525 | a/a, but small, trillobites(?) 1/4 mm long; small pelcepoels(?) or ostracools, flat, 1/4 mm in dia, in med gry ls.                                                                                                                                                            |
| 5525 - 5530 | 100% Ls, 3/4 brnsh gry to ol gry, 5 to 10% mtld w/ v lt gry sec xls, 15% to 20% show md dk gry argil pell up to 1/4 mm in dia      Susp in                                                                                                                                    |

SAMPLE DESCRIPTION - Contd

From   To

ls, loc argil stks, dns, 10% or less rexld; 1/4 ylsb gry, micro to  
crypto xln, prtly suc, var deg rexld, 20% rexld (ave), nil por

5530 - 5535      a/a

5535 - 5540      a/a, but 50% ylsb gry and 50% brnsh gry to ol gry a/a

5540 - 5545      a/a, but 80% ylsb gry and 20% brnsh gry to ol gry a/a

5545 - 5550      a/a, still some unkn blk fos dk desc - poss algal?

5550 - 5555      100% Ls a/a, but 60% lt ol gry to ol gry, pred crpto xln, dns, a/a  
40% lt ylsb gry to ylsb gry w/ sev stks md dk gry pell argil matter,  
trc fos a/a. Trc Dolo, lt ol gry to lt ylsb gry, micro xln, suc, nil  
to fair intr xln por

5555 - 5560      a/a

5560 - 5565      a/a

5565 - 5570      50% Ls, a/a, 1/3 ol gry 2/3 lt ylsb gry a/a, 50% Dolo, v lt gry to lt  
ol gry, micro xln, suc, f/g intr xln por

5570 - 5575      a/a but 80% Ls a/a, 20% Dolo a/a, trc mod rd stnd ls

5575 - 5580      a/a, but 85% Ls a/a, 15% Dolo a/a, trc pnksh and md dk gry ls

5580 - 5585      a/a, but 90% Ls a/a, 10% Dolo a/a

5585 - 5590      70% Ls a/a, 30% Sh, grnsh gry, med dk gry, lt rd, grysh org, grnsh gry  
mtld, w/rdsh brn.

5590 - 5595      a/a, but 40% Sh, ls bcmg 60% det, pell/ool, up to 1 mm

5595 - 5600      Trc Ss, vf/crs, poorly sort, qtz, v lt gry, rnd, calc cem, com sd  
gr in ls. 40% Sh a/a 60% Ls, 2/3 a/a, 1/3 org pnk to v pl org,  
pred micro xln, some crypto xln, suc, loc fair intr xln por, gen  
nil to v poor.

SAMPLE DESCRIPTION - Contd

From   To

|             |                                                                                                                                                                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5600 - 5605 | <u>90% Ls</u> , org pnk to v pl org a/a, pred v pl org, micro xln, suc, sli dolie to dolie ls, <u>est</u> 10% Dolie Ls, more crsly xln to 1/32 mm, dolie ls has fair effective por, finer ls to finely xln to have but poor effective por. Trc Sh a/a |
| 5605 - 5610 | a/a                                                                                                                                                                                                                                                   |
| 5610 - 5620 | 65% Dolo, grysh org pnk to mod org pk, micro xln, suc, nil effect por except for about 10% dolie ls a/a. <u>35% Ls</u> , a/a, pred v pl org a/a. Trc Sh, a/a                                                                                          |
| 5620 - 5625 | 85% Dolo, grysh org pnk a/a. 15% Ls, v pl org, a/a                                                                                                                                                                                                    |
| 5625 - 5630 | a/a                                                                                                                                                                                                                                                   |
| 5630 - 5635 | a/a                                                                                                                                                                                                                                                   |
| 5635 - 5640 | a/a, but 90% Dolo a/a, 10% Ls, a/a, trc lmy dolo, v pl org, micro xln, suc a/a but w/poor p-pt vug por as well as fair intr xln por.                                                                                                                  |
| 5640 - 5645 | a/a                                                                                                                                                                                                                                                   |
| 5645 - 5650 | a/a, but <u>70% Dolo</u> a/a, <u>30% Ls</u> , a/a, still abt 10% of sample shows f intr xln por in lmy dolo a/a                                                                                                                                       |
| 5650 - 5655 | a/a, but <u>60% Ls</u> a/a, <u>40% Dolo</u> a/a                                                                                                                                                                                                       |
| 5655 - 5660 | <u>10% Dolo</u> , grysh org pk a/a. <u>65% Ls</u> , v pl org, a/a trc fair por in wh micro xln, suc. <u>25% Lmy Dolo</u> , pred v pl org, micro xln, suc, fair intr xln por                                                                           |
| 5660 - 5665 | <u>10% Dolo</u> , a/a; <u>10% Lmy Dolo</u> , a/a. <u>80% Ls</u> , a/a but abt 30% shows poor/fair intr xln por in wh micro xln, suc, a/a                                                                                                              |
| 5665 - 5670 | <u>75% Ls</u> , a/a, but only abt 15% shows effect por, <u>15% Lmy Dolo</u> , pred v pl org to pl grysh pk, micro xln, suc, fair intr xln effect por, a/a, in abt 1/2                                                                                 |

SAMPLE DESCRIPTION - Contd

From   To

|             |                                                                                                                                                                                                                                |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5670 - 5675 | <u>90% Lmy Dolo</u> a/a, intr xln por a/a; <u>10% Ls</u> , a/a                                                                                                                                                                 |
| 5675 - 5680 | a/a but Lmy Dolo bcmg prtly dolo                                                                                                                                                                                               |
| 5685 - 5690 | a/a but trc p-pt vug por in lmy dolo                                                                                                                                                                                           |
| 5690 - 5695 | a/a but some vf xln w/gd intr xln por. Sample has abt 10% var sh, pred dk gry/grnsh gry, cvgs(?)                                                                                                                               |
| 5695 - 5700 | a/a                                                                                                                                                                                                                            |
| 5700 - 5705 | a/a, but try wh suc micro xln sec anhy and only trc sh a/a - prob cvgs(?), effect <del>por</del> decr to about 20% of sample                                                                                                   |
| 5705 - 5710 | a/a                                                                                                                                                                                                                            |
| 5710 - 5715 | a/a, but abt 50% of sample show effect por a/a                                                                                                                                                                                 |
| 5715 - 5720 | a/a                                                                                                                                                                                                                            |
| 5720 - 5725 | <u>70% Lmy dolo</u> a/a w/abt 50% of sample having effect por <u>30% Dolo</u> , lt ol gry, micro xln to v f xln, suc, fair/gd intr xln por, trc p-pt vug por, grc of blk resid which give no cut. Trc brn gry argil ls, dolie. |
| 5725 - 5730 | a/a, but fair p-pt vug por and 40% lt ol gry dolo.                                                                                                                                                                             |
| 5730 - 5735 | a/a, but 50% dolo, lt ol gry a/a. and 10% of sample lt gry to med gry ls, micro xln, prt suc, 30 to 70% rexd; trc ol gry ls, crypto xln, dns; trc dk gry sh.                                                                   |
| 5735 - 5740 | a/a, but <u>40% Dolo</u> , lt ol gry a/a; <u>40% Lmy Dolo</u> a/a; 20% Ls, v lt to md gry, ol gry, micro to crypto xln, dns                                                                                                    |
| 5740 - 5745 | a/a, but <u>30% Dolo</u> , a/a, <u>30% Lmy Dolo</u> , a/a, and <u>40% ls</u> , a/a, but argil stks and com blk fos give part mtld appr, foss look like trilobits                                                               |
| 5745 - 5750 | a/a, but 70% Ls, a/a, trc dk gry/dk grnsh gry sh, <u>trc Ss</u> , lt gry, calc cem, qtzse, f, w sort, tt (cvgs-?)                                                                                                              |

SAMPLE DESCRIPTION - Contd.

From   To

5750 - 5755

a/a prob, almost all trip cvgs

5755 - 5760

a/a, but less cvgs

5760 - 5765

100% Ls, a/a v lt gry to dk gry to ol gry (minor amt), pred micro xln, some crpto xln, 80% ave rexld, mic to f, dns, fos a/a, looks prtly det, dk gry due to fos and argil mat, gen has mtld appear, dns, trc dk gry sh, ptly calc.

5765 - 5770

a/a

5770 - 5775

90% Ls, a/a; 10% Sh, dk gry, a/a, trc rdsh sh

5775 - 5780

a/a but stg trc rd brn sh, stk ylsh org, mod red, poss cvgs(?), micro xln clus pyr

5780 - 5785

a/a

5785 - 5790

a/a, but 80% Ls, 20% Sh

5790 - 5795

a/a, but 70% Ls, 30% Sh, sh have grnsh tint

5795 - 5800

a/a, but 60% Ls, 40% Sh, sh pred grnsh gry, some grnsh gry micro xln suc ls.

5800 - 5805

a/a, but 10% Sh, rdsh brn, pl purp, ylsh org, lt to med grnsh gry, some lt bl grn w/f qtz g susp

5805 - 5810

a/a, but 30% Ls, 70% Sh; sh var a/a w/com qtz g, much mtlg; ls has gd brach frags.

5810 - 5815

a/a, but ls prtly rexld to md

5815 - 5820

100% Dolo, pred lt ol gry, to lt grnsh gry, some brn tinting, micro xln, suc, some vf xln, trc fair intr xln, por, gen nil por, abt 20% lmy, more fnly xln than dolo. No shows

SAMPLE DESCRIPTION - Contd

From   To

|               |                                                                                                                                                                                                         |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5820 - 5825   | a/a, but about 1/3 sample lmy dolo to dolo ls a/a. Dolo show trc p-pt vug por.                                                                                                                          |
| 5825 - 5830   | a/a, but no p-pt vug por, trc bryazon                                                                                                                                                                   |
| 5832 - 20 min | 50% Ls, ol gry, pred crypto xln, dns. <u>50% Dolo and Lmy Dolo, a/a</u>                                                                                                                                 |
| 40 min        | <u>70% Ls, a/a, 30% Dolo and Lmy Dolo, a/a.</u>                                                                                                                                                         |
| 60 min        | <u>60% Ls, a/a; 40% Dolo and Lmy Dolo, a/a</u>                                                                                                                                                          |
| 80 min        | <u>20% Ls, a/a; 80% Dolo, a/a, 40% a/a, 60% lt yls gry to yls gry, micro xln to v f xln, suc, gd/excel intr xln por, gd p-pt vug por, por est at 20%. <u>No shows.</u></u>                              |
| 5832 - 5842   | Cored - See Core #1 Description                                                                                                                                                                         |
| 5842 - 5845   | a/a, but nearly all trip cvgs                                                                                                                                                                           |
| 5845 - 5850   | a/a, 70% cvgs                                                                                                                                                                                           |
| 5850 - 5855   | <u>80% Ls, a/a, ol gry, gnsh gry, crypto xln, dns; 20% Dolc a/a, lt ol gry, pnksh gry, micro xln, poor to excel intr xln por, drilling time indicates that por dolo primarily from reamed rat hole.</u> |
| 5855 - 5860   | a/a, but com calc vnltz in ls                                                                                                                                                                           |
| 5860 - 5865   | <u>90% Ls a/a; 10% Dolo, a/a, but pred nil por, lmy</u>                                                                                                                                                 |
| 5865 - 5870   | a/a, but stg trc of dk gry argil stks in ls                                                                                                                                                             |
| 5870 - 5875   | a/a, but sli trc p-pt vug por in dolo                                                                                                                                                                   |
| 5876 - 30 min | a/a                                                                                                                                                                                                     |
| 5876 - 5897   | Cored - See Core #2 Description                                                                                                                                                                         |
| 5897 - 5900   | a/a, but nearly all trip cvgs                                                                                                                                                                           |
| 5900 - 5905   | <u>50% Ls a/a; 50% Dolo, a/a, f/excel intr xln por, no shows</u>                                                                                                                                        |

SAMPLE DESCRIPTION - Contd

From    To

|             |                                                                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 5905 - 5910 | a/a, but dolo has some p-pt vug por                                                                                                                 |
| 5910 - 5915 | <u>10% Ls</u> a/a; <u>90% Dolo</u> , pnksh gry, crypto to micro xln, perm low, "earthy" type intr xln por, still suc, trc dolo w/f intr xln por a/a |
| 5915 - 5920 | <u>Trc Ls</u> a/a; <u>100% Dolo</u> , a/a                                                                                                           |
| 5920 - 5925 | a/a, but trc vf sdy stks in ls, rnd qtz(?) g, gry and grnsh gry g, det in pt                                                                        |
| 5925 - 5930 | a/a, but trc poor p-pt por                                                                                                                          |
| 5930 - 5935 | a/a                                                                                                                                                 |
| 5935 - 5940 | a/a                                                                                                                                                 |
| 5940 - 5945 | <u>Trc Ls</u> a/a; <u>100% Dolo</u> , 1/2 pnksh gry w/"earthy" por a/a, 1/2 ylsh gry/v lt ol gry, pred micro xln, suc, f/excel intr xln por         |
| 5945 - 5950 | a/a, but trc ylsh gry dolie ls.                                                                                                                     |
| 5950 - 5955 | a/a, but micro xln, suc, dolo bcmg pred lt ol gry, sample abt 40% micro xln, 60% crypto xln a/a                                                     |
| 5955 - 5960 | <u>10% Ls</u> , pred crypto xln, v lt grnsh gry, prtly suc, dns, hd. <u>90% Dolo</u> but only 20% micro xln.                                        |
| 5960 - 5965 | a/a                                                                                                                                                 |
| 5965 - 5970 | a/a, but much crypto xln dolo lmy, 40% micro xln.                                                                                                   |
| 5970 - 5975 | a/a, but 60% micro xln, a/a, w/ por a/a                                                                                                             |
| 5975 - 5980 | <u>10% Ls</u> , a/a, but v lt gnsh gry to gnsh gry, crypto xln, dns <u>90% Dolo</u> , a/a, 20% micro xln, 80% crypto xln                            |
| 5980 - 5985 | <u>Trc Ls</u> , a/a; <u>100% Dolo</u> , a/a, but 70% micro xln, 30% crypto xln, abt 1/3 micro xln had gd/excel intr xln por, remainder gen poor     |
| 5985 - 5990 | a/a, but dolo 90% micro xln, suc, w/ gd gd to excel intr xln por, pred lt                                                                           |

SAMPLE DESCRIPTION - Contd.

From   To

ol gry.

5990 - 5995

a/a, but dolo pred v lt ol gry to pnksh gry, some lt ol gry, micro xln, suc, abt 1/3 shows gd/excel intr xln por, 1/3 poor/fair intr xln por, 1/3 nil/v poor intr xln por. This sample is the first one in the Red River that has definite fos det, a completely rexld crinoid stem and one completely rexld brach frag found, it appears that most fos det destroyed by rexlztn

5995 - 6000

a/a, but no fos apparent in dolo, trc crs xls in both ls and dolo

6000 - 6005

50% Dolic Ls, v lt ylsh gry to pnksh gry, gen crypto xln, indistinct crs fos det(?), 10% or less crs sec xls, hd, dns. 50% Dolo, a/a, but only abt 20% had f/excel intr xln por, but still pred micro xln, suc

6005 - 6010

60% Dolic Ls a/a; 40% Dolo, a/a

6010 - 6015

80% Dolic Ls a/a; 20% Dolo a/a

6015 - 6020

90% Dolic Ls a/a; 10% Dolo a/a

6020 - 6025

a/a, but ls bcmg sli less dolic

6025 - 6030

a/a, but some micro xln, suc, dolic ls, p/f intr xln por

6030 - 6035

a/a, but nil intr xln por, up to 40% micro xln

6035 - 6040

a/a

6040 - 6045

a/a

6045 - 6050

a/a, but 10% dolic ls, suc, micro xln, has p/f intr xln por, some lt brn stg on md lt gry micro xln dolo.

6050 - 6055

a/a, but 10% has f/g intr xln por, por bcmg lmy dolo.

6055 - 6060

a/a, but 15% has f/g intr xln por

6060 - 6065

65% Dolic Ls, a/a, por v dolic; 35% Dolo, lt ol gry pred, micro xln, suc, abt 1/2 show f/gd intr xln por a/a, md hd/md sft.

SAMPLE DESCRIPTION - Contd

From   To

|               |                                                                         |
|---------------|-------------------------------------------------------------------------|
| 6065 - 6070   | a/a                                                                     |
| 6070 - 6075   | <u>80% Dolic Ls</u> , a/a; <u>20% Dolo</u> , a/a                        |
| 6075 - 6080   | <u>75% Dolic Ls</u> , a/a; <u>25% Dolo</u> , a/a                        |
| 6080 - 6085   | a/a                                                                     |
| 6085 - 6090   | a/a, but ls pred lt ylsb gry, crypto xln, suc, with minor amt micro xln |
| 6090 - 6095   | suc lt ol gry, 10% f/crs xls in ls; dolo is only 1/4 to 1/3 por a/a     |
|               | a/a                                                                     |
| 6095 - 6100   | a/a                                                                     |
| 6100- 6105    | a/a, but <u>80% Dolic Ls</u> , <u>20% Dolo</u>                          |
| 6105 - 6110   | a/a, but incr amt crs fos det, mainly brachs                            |
| 6110 - 6115   | a/a, but <u>85% Dolic Ls</u> , <u>15% Dolo</u> , decr amt fos           |
| 6115 - 6120   | a/a                                                                     |
| 6120 - 6125   | a/a, but <u>90% Dolic Ls</u> , <u>10% Dolo</u> .                        |
| 6125 - 20 min | a/a                                                                     |
| 40 min        | a/a                                                                     |
| 60 min        | a/a                                                                     |
| 80 min        | a/a, but trc lt brnsh gry dolo, micro xln, suc, p intr xln por.         |

NOTE: Sample depths shown correspond to sample sets on file with the State of South Dakota and with Amstrat. None of the samples were lagged. A Geological Society of America rock color chart was used in describing all colors.

## CORE DESCRIPTION

Core #1, 5832 - 42, Cut 10', Recovered 10'

- 5832.0-5832.5 .5' Dolomite, v lt ol gry, micro xln, suc, xl sz rg fr 1/128 to 1/32 mm, md hd, good/excel intr xln por; appears wet, no shows.
- 5832.5-5836.1 3.6' Dolomite, v lt ol gry to ylsb gry, loc mtld, micro xln, suc, xl sz rg fr 1/128 to 1/16 mm, md sft, excel intr xln por, gd/excel vug and p-pt vug por, up to 1 to 2 mm ave dia, com lt brn stn on brks, stn bcms ltr w/exp to air, trc clr calc filling vugs - secdy, trc hr ln to 1/8" md gry stks, appears wet, no shows.
- 5836.1-5836.5 .4' Dolomite, a/a, but nil amt of vug and p-pt por, incr in amt of secdy calcite and ls, gen in stks, sli decr in intr xln por, appears wet, no shows.
- 5836.5-5837.0 .5' Dolomite and Limestone, top dolo, bot ls, grad between, dolo lt ol gry to ol gry w/md dk gry stks a/a, gives lam appr, crypto to micro xln, v low intr xln por, hd; ls, color same as dolo, all crypto xln, dns, sec wh micro xln calc clust. No shows.
- 5837.0-5837.8 .8' Limestone, lt ol gry, crypto xln, concoid frac when brkn, trc crs sec xls, occ hr ln md dk gry argil stks abt 1/2" to 3/4" apart, hd, dns, no shows.
- 5837.8-5838.5 .7' Limestone, ol gry w/20% md argil stks a/a, has bnnd apr, crypto to micro xln, ave xl sz abt 1/256 mm, hd dns, no shows.
- 5838.5-5842.0 3.5' Limestone, md lt ol gry to ol gry, mtld, md dk gry argil stks w/abdt brach shells up to 12 mm in stks, shells not brkn or abraded, crypto xln, concoid frac when brkn, hd, dns, no shows.

Core #2, 5876 - 97, Cut 21', Recovered 20'

- 5876.0-5876.5 .5' Limestone, a/a from 5838.5 to 5842.0, but no fos.
- 5876.5-5878.0 1.5' Limestone, lt ol gry, crypto xln, semi concoid frac when brkn, sli trc vf sec xls scat thru out Hd, dens, no shows.
- 5878.0-5878.2 .2' Limestone, a/a but up to 25% md dk gry argil stks.

CORE DESCRIPTION - Contd

- 5878.2-5879.7      1.5' Dolomite, v lt ol gry to lt ol gry to pnksh gry, micro xln, suc, md dk gry hr in to 1/8" argil stks, give irreg bndd apr; badly bret w/pnksh gry filling between bret pieces, pnksh gry lmy, apr sec, sli p-pt vug por, fair/gd intr xln por; dolo has fair/gd intr xln por, appears wet, no shows.
- 5879.7-5881.5      1.8' Dolomite, ol gry to pnksh gry, micro xln, suc, sim to ab but not bret, argil stks a/a, ltr dolo bndd w/dkr and also occ as blebs in dkr, lt to mod brn stg com espec on ltr dolo, bcms dkr w/exp to air, gd to excel intr xln por, fr tp gd p-pt and vug por, w/vug dia up to 3/8", gen md soft, appears wet, no shows.
- 5881.5-5883.1      .6' Dolomite, a/a, but less argil stks, bndd apr irreg a/a, vugs rare and elong and prll w/stks, ave dia und 1/16", appears wet, no shows.
- 5883.1-5884.2      1.1' Dolomite, a/a, but p-pt and vug por as in int from 5879.7 to 5881.5, appears wet, no shows.
- 5884.2-5885.5      1.3' Dolomite, lt ol gry to pnksh gry, mtld in irreg bnds w/ lt gry stks (up to 10%), micro xln, suc, fair to gd intrxln por, nil p-pt and vug por, appears wet, no shows.
- 5885.5-5886.3      .8' Dolomite, a/a but bret and some f/g p-pt and vug por, appears wet, no shows.
- 5886.3-5887.0      .7' Dolomite, a/a, but not bret and nil p-pt and vug por, "earthy" type intr xln por, bndg very irreg, xln ty apprs finer than above dolo section, partly/pred cryptoxln, appears wet, no shows.
- 5887.0-5896.0      9' Dolomite, a/a, but bdly brkn, vert fracs com, 1" to 2" apart, still bndd/mtld apr a/a fr hr ln to 2". por a/a and perm nil, appears wet, no shows.
- 5896.0-5897.0      1' Not recovered.

CORE ANALYSIS (Continental Laboratories, Inc.)

|           | <u>Porosity</u> | <u>Permeability</u> | <u>Oil Sat</u> | <u>Water Sat</u> |
|-----------|-----------------|---------------------|----------------|------------------|
| 5832-5833 | 27%             | 25md                | 0%             | 44%              |
| 5834-5835 | 29              | 265                 | 0              | 68               |
| 5878-5879 | 16              | 1.4                 | 0              | 60               |
| 5879-5880 | 20              | 27                  | 0              | 51               |
| 5880-5881 | 22              | 54                  | 0              | 66               |
| 5881-5882 | 22              | 3.8                 | 0              | 68               |
| 5882-5883 | 21              | 3.4                 | 0              | 66               |
| 5883-5884 | 18              | 5.6                 | 0              | 58               |
| 5884-5885 | 20              | 2.6                 | 0              | 65               |
| 5885-5886 | 20              | 27                  | 0              | 53               |
| 5886-5887 | 16              | 1.4                 | 0              | 64               |
| 5890-5891 | 12              | < 0.1               | 0              | 67               |
| 5892-5893 | 18              | 1.8                 | 0              | 65               |
| 5894-5896 | 21              | 1.4                 | 0              | 71               |

### DRILL STEM TESTS

#1 4470' to 4558' (Conventional test)

Ran two 7" packers with 4' between packers.

Initial open was 2 minutes.

Initial shut in was 30 minutes.

Opened 2 hours, immed blow increased to strong in 22 minutes, remained strong until shut in.

Shut in 2 hours and 15 minutes.

Recovered 945' of muddy water, no shows.

Pressures were as follows:

|      |      |           |     |     |
|------|------|-----------|-----|-----|
| IHMP | 2506 | ISIP 2024 | IFP | 126 |
| FHMP | 2492 | FSIP 1954 | FFP | 452 |

Charts indicate a valid test was made of the interval.

#2 4583 to 4743 (Conventional test)

Ran one 7" packer

Initial open was 2 minutes

Initial shut in was 30 minutes

Opened 1 hour, immed blow increased to strong in 1 minute, remained strong until shut in.

Shut in 1 hour.

Recovered 2737' of muddy black sulfur water.

Pressures were as follows:

|      |           |      |           |     |           |
|------|-----------|------|-----------|-----|-----------|
| IHMP | 2565/2577 | ISIP | 2065/2024 | IFP | 359/353   |
| FHMP | 2565/2577 | FSIP | 2065/2024 | FFP | 1177/1217 |

DRILL STEM TESTS - Contd

Charts indicate a valid test was made of the interval.

#3 5873 to 5897 (Conventional test)

Ran one 7" packer.

Initial open was 2 minutes.

Initial shut in was 30 minutes.

Opened 1 hour, immed blow increased to strong within 3 minutes, remained strong until shut in.

Shut in 1 hour and 30 minutes.

Recovered 2660' of total fluid consisting of 600' water cut mud and 2060' of black sulfur water.

Pressures were as follows:

|      |           |      |           |     |           |
|------|-----------|------|-----------|-----|-----------|
| IHMP | 3286/3356 | ISIP | 2287/2393 | IFP | 248/296   |
| FHMP | 3258/3328 | FSIP | 2482/2506 | FFP | 1049/1075 |

Charts indicate a valid test was made of the interval.

WATER ANALYSIS (Yapuncich, Sanderson, and Brown Laboratories, Billings, Montana)

Constituents in ppm unless otherwise stated

|        | Sodium | Calcium | Magnesium | Sulfate | Bicarbonate | Chloride | Chloride<br>as NaCl | pH  | Resistivity<br>ohms/m |
|--------|--------|---------|-----------|---------|-------------|----------|---------------------|-----|-----------------------|
| DST #1 |        |         |           |         |             |          |                     |     |                       |
| Top    | 5673   | 700     | 0         | 6061    | 170         | 5335     | 8797                | 8.9 | 0.46                  |
| Middle | 15909  | 1540    | 312       | 4860    | 660         | 24205    | 39914               | 7.2 | 0.17                  |
| Bottom | 16592  | 1540    | 312       | 4740    | 500         | 25440    | 41591               | 6.4 | 0.16                  |
| DST #2 |        |         |           |         |             |          |                     |     |                       |
| Top    | 2892   | 740     | 0         | 6251    | 220         | 1032     | 1702                | 8.2 | 0.83                  |
| Middle | 1744   | 700     | 192       | 2996    | 620         | 1917     | 3161                | 7.4 | 1.03                  |
| Bottom | 1630   | 720     | 192       | 2753    | 670         | 1927     | 3178                | 7.7 | 1.05                  |
| DST #3 |        |         |           |         |             |          |                     |     |                       |
| Top    | 2503   | 540     | 0         | 4568    | 195         | 1334     | 2200                | 8.2 | 0.96                  |
| Middle | 1896   | 860     | 204       | 1516    | 340         | 3724     | 6140                | 7.1 | 0.86                  |
| Bottom | 1936   | 860     | 204       | 1478    | 340         | 3815     | 6291                | 7.2 | 0.86                  |

# **ADMINISTRATIVE / SUNDRY REPORTS**

STATE OIL AND GAS BOARD  
PIERRE, SOUTH DAKOTA  
APRIL 23, 1963

A special meeting of the State Oil and Gas Board was held in the office of the Secretary of State at 3:00 o'clock p.m., April 23, 1963

PRESENT: John Trevillyan, Executive Aide to the Governor  
Walter Weygint, Assistant Attorney General  
Bernard Linn, Commissioner of School and Public Lands  
Essie Wiedenman, Secretary of State and Secretary State Oil and Gas Board.

Mr. Trevillyan, Executive Aide to the Governor, called the meeting to order.

Mrs. Wiedenman, Secretary State Oil and Gas Board, presented to the Board Notice of Intention to Abandon Well for W. S. Kilroy, 2150 First National Bank Bldg., Denver 2, Colorado, covering the #1 Scholl oil test on Section 26, T. 18 N., R. 21 E., Corson County, South Dakota, together with the Well Plugging Affidavit of said well. After a short discussion it was moved by Mr. Weygint, Assistant Attorney General and seconded by Mr. Linn, Commissioner of School and Public Lands, that the Well Plugging Affidavit and Notice of Intention to Abandon the Kilroy #1 Scholl Well located 660' South and 660' West from the NE/NW Corner of Section 26, Township 18 North, Range 21 East, of the BHM, Corson County, South Dakota, be approved, and the liability under Bond #8007-24-77, executed by the Federal Insurance Company, a corporation of the state of New Jersey as Surety and Mr. W. S. Kilroy and Mr. J. S. Swindler, Denver 2, Colorado, as principal, in the amount of \$3,000.00, conditioned upon compliance with the law and rules and regulations of the Oil and Gas Board concerning wells to be drilled in Tripp County, South Dakota, be, and the same is hereby terminated and at an end from and after this date, and the bond of \$3,000.00 given in connection with the drilling of said well, be released.

On roll call all voted "aye" and motion carried.

STATE OIL AND GAS BOARD  
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On roll call all voted "aye" and motion carried.

April 10, 1963

Mrs. Essie Wiedenman  
Secretary of State  
Secretary State Oil and Gas Board  
State Capitol  
Pierre, South Dakota

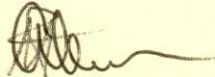
Dear Mrs. Wiedenman:

Reference is made to the Kilroy #1 Scholl oil test in Sec. 26  
T. 18 N., R. 21 E., Corson County, South Dakota.

Earl Cox has scouted the location and finds that the pits have  
been filled.

I have approved the plugging and am enclosing the original and  
one copy of that affidavit, the notice of Intent to Drill, and the  
Log and Core Record. I recommend that the bond be released on this  
well.

Sincerely yours,



Allen F. Agnew  
State Geologist

AFA/ab

State of South Dakota  
State Oil and Gas Board

STATE OF SOUTH DAKOTA

County of \_\_\_\_\_

} ss.

## WELL PLUGGING AFFIDAVIT

AND

being first duly sworn, do depose and say the following is a true and correct statement of the details of the plugging of a certain well drilled for oil

(Indicate whether for oil, gas, water or other purposes)

known as the Scholl Number 1 and located  
(Name, if any)  
as follows: 660 feet North; 1980 feet South;          feet East;          feet West  
of the Northwest corner of the          Quarter of the          Quarter of the           
Quarter of Section 26, Township 18 N (North or ~~South~~) Range 21 E  
(East or ~~West~~), of the Black Hills Principal Meridian, Corson County, South Dakota.  
Elevation of well above sea level is 2323 feet.  
Elevation taken at Kelly Bushing 12' above ground  
(Derrick floor or Ground)

Total depth of well is 6128 feet. Date permit to drill issued June 21, 1961Permit issued to W. S. Kilroy, 2150 First Natl. Bk. Bldg., Denver 2, Colo.Date drilling begun June 28, 1961Date drilling completed July 23, 1961Kind of drilling tools used rotaryDate plugging begun July 22, 1961Date plugging completed July 23, 1961Lessor          Address         Lessee          Address         Drilling Contractor Circle A Drlg Co. Address         

## DETAILS OF PLUGGING

|                                                              |                            |                    |      |
|--------------------------------------------------------------|----------------------------|--------------------|------|
| Filled with <u>cement</u>                                    | From <u>top of surface</u> | To <u>        </u> | feet |
| (Rotary Mud, Cement, or Other Materials)                     |                            |                    |      |
| Kind of Plug <u>cement</u>                                   | From <u>270</u>            | To <u>360</u>      | feet |
| Filled with <u>rotary mud</u>                                | From <u>360</u>            | To <u>3210</u>     | feet |
| Kind of Plug <u>cement</u>                                   | From <u>3210</u>           | To <u>3300</u>     | feet |
| Filled with <u>rotary mud</u>                                | From <u>3300</u>           | To <u>4100</u>     | feet |
| Kind of Plug <u>cement</u>                                   | From <u>4100</u>           | To <u>4190</u>     | feet |
| Filled with <u>rotary mud</u>                                | From <u>4190</u>           | To <u>4550</u>     | feet |
| Kind of Plug <u>cement</u>                                   | From <u>4550</u>           | To <u>4650</u>     | feet |
| Other details <u>rotary mud</u>                              | <u>4650</u>                | <u>5760</u>        |      |
| If a producing well, give date and amount of last production | <u>5760</u>                | <u>5850</u>        |      |

never produced

## CASING RECORD

| Size   | PUT IN WELL<br>Feet Inches | PULLED OUT<br>Feet Inches | LEFT IN WELL<br>Feet Inches | Remarks |
|--------|----------------------------|---------------------------|-----------------------------|---------|
| 8-5/8" | 338                        | none                      | 338                         | Surface |

Reid M. Waltman  
(Signature of person, firm or corporation having custody or control of well)

Per W. S. KilroyAddress 2150 First National Bank Bldg., Denver 2, Colo

(Signature and title of party supervising plugging of well)

Address         Subscribed and sworn to before me this 8th day of August, A. D., 1961My commission expires My Commission expires March 15, 1964

Virginia R. Nowlin  
Notary Public in & for  
City & County of Denver  
Colo.

Plugging approved by  
Allen F. Agnew  
State Geologist  
April 10, 1963

**State of South Dakota**  
**State Oil and Gas Board**

## LOG AND CORE RECORD OF OIL AND GAS WELL

Operator W. S. Kilroy & J. S. Swindler Field Wildcat  
Well Scholl Number 1 Section 26  
(Name, if any)  
Township 18 N Range 21 E in Gorson County.

### FORMATIONS PENETRATED BY WELL

| Date                                                                                                                           | Depth to<br>Top of<br>Formation | Thickness | Drilled or<br>Cored | Recovery | Formation |
|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------|---------------------|----------|-----------|
| <p>In order to supply more complete information, a well report and sample log are submitted in lieu of filling out form 7.</p> |                                 |           |                     |          |           |

**State of South Dakota  
State Oil and Gas Board**

**NOTICE OF INTENTION TO ABANDON WELL**

Oil and Gas

(Oil and Gas) (Stratigraphic)

Isabel

South Dakota,

July 22

19 61

**STATE OIL AND GAS BOARD**

Vermillion

South Dakota

In compliance with Chapter 153 Session Laws 1943 and all laws amendatory, relevant, or supplemental thereto and Rules and Regulations of the Oil and Gas Board, notice is hereby given that it is our intention to abandon well #1 Scholl

(Name, if any)

Number 1, Section 26, Township 18 North

Range 21 East, Field Wildcat, County of Corson

commencing work on the 22 day of July, 19 61

The present condition of the well is as follows:

**1. Complete casing record.**

338' 8-5/8" 24# Surface Casing

**2. Last produced** Never Produced

Date

Net Oil

Gravity

Cut

The proposed work is as follows:

Plug Well as follows:

10 sx Top of surface

30 sx across base of surface 270-360'

30 sx across Dakota 3210-3300

30 sx top of Roundtop mem

of the Minnelusa 4100-4190

30 sx top of Mission Canyon 4550-4650

30 sx top of Red River 5760-5850

W. S. Kilroy and

J. S. Swindler

(Name of Operator)

By

*Reed M. Walkman*

# **CORRESPONDENCE**

APR 8 - 1963



SOUTH DAKOTA  
STATE GEOLOGICAL SURVEY

SCIENCE CENTER  
ON THE CAMPUS OF THE STATE UNIVERSITY  
VERMILLION

ALLEN F. AGNEW, STATE GEOLOGIST  
AND DIRECTOR  
TEL. MARKET 4-4471

Belle Fourche, South Dakota  
April 6, 1963

Re: Kilroy #1 Scholl oil test  
NENW-26-18N-21E  
Corson County

Dear Allen,

In filling the mud pits at the above location, the surface above the pits has been left somewhat higher than the surrounding ground. The location is not very smooth as the ground was frozen when the work was done. The location is on stock grazing land. The location presents no danger to livestock.

If the samples, logs, and completion papers have been received, it is suggested the bond be released.

Sincerely,

*Earl Cox*  
Earl Cox

April 2, 1963

Mr. Earl J. Cox  
State Geological Survey  
Box 208  
Belle Fourche, South Dakota

Dear Earl:

I am enclosing a photocopy of a letter from Kilroy to Walter Weygint, stating that the pits have been filled and the location restored on the #1 Scholl, Sec. 26 T. 18 N. R. 21 E., Corson County, South Dakota.

Please check this out at your earliest convenience, so that we can know whether the bond may be released or not.

Sincerely yours,



Allen F. Agnew  
State Geologist

AFA/ab

Enclosure

MAR 30 1963

KILROY COMPANY OF TEXAS, INC.

1908 FIRST CITY NATIONAL BANK BUILDING

HOUSTON 2, TEXAS

March 26, 1963

TELEPHONE  
CAPITOL 6-0731

State of South Dakota  
Office of the Attorney General  
Pierre, South Dakota

Attention: Mr. Walter Weygint  
Assistant Attorney General

#1 Scholl, Corson County, S. D.  
W. S. Kilroy Oil & Gas Lease Bond  
Federal Insurance Company Bond  
8007-24-77

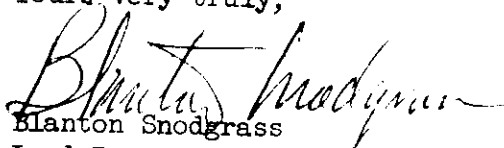
Gentlemen:

Referring to your letter of December 20, 1962, and our letter of January 3, 1963, pertaining to the above caption, please be advised that the drill site of our #1 Scholl well located in the NE/4 NW/4 of Section 26, Township 18 North, Range 21 East, Corson County, South Dakota, has now been restored to as nearly possible its original condition. This restoration work was performed by Waggner Bros. Inc. of Reeder, North Dakota. They have advised us the work was completed January 8, 1963.

Inasmuch as the restoration work has now been completed in connection with the aforementioned drill site we will appreciate your releasing the captioned bond.

Your cooperation in this matter is certainly appreciated.

Yours very truly,

  
Blanton Snodgrass  
Land Department

BS:dd

*Verifax copy from  
Sec of State Office  
3-29-63*

KILROY COMPANY OF TEXAS, INC.

1908 FIRST CITY NATIONAL BANK BUILDING

HOUSTON 2, TEXAS

TELEPHONE  
CAPITOL 5-0517

February 26, 1963

MAR 2 1963

Waggoner Bros., Inc.  
Reeder, North Dakota

Re: Kilroy Company of Texas, Inc.  
Scholl #1  
Cen. NE/4 NW/4, Sec. 26, T-18-N, R-21-E  
Corson County, South Dakota

Gentlemen:

It is my understanding that you have agreed to fill in the mud pits and clean up the location of the subject well and send your billing directly to us. The last report I had was that you were waiting for favorable weather to accomplish this job.

We have not heard from you nor received any billing since that time.

The State Geological Survey of South Dakota is anxious to have this location cleaned up. Will you please let us know your estimate of the time when this job can be economically accomplished.

Yours very truly,

KILROY COMPANY OF TEXAS, INC.



G. S. Rohe

GSR:mh

cc: Mr. Allen F. Agnew ✓

KILROY COMPANY OF TEXAS, INC.

1908 FIRST CITY NATIONAL BANK BUILDING

HOUSTON 2, TEXAS

October 22, 1962

TELEPHONE  
CAPITOL   
8-0731

OCT 25 1962

Mr. Allen F. Agnew  
State Geological Survey  
Campus of the State University  
Vermillion, South Dakota

Re: Kilroy #1 Scholl  
Sec. 26, T-18N, R-21E  
Carson County, South Dakota

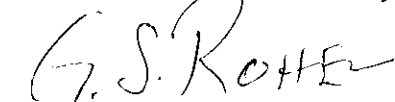
Dear Mr. Agnew:

I have arranged this date with a man (from Tioga, North Dakota) familiar with that area of the country, and the Rules and Regulations of South Dakota to make a trip to the well site and hire whatever equipment and personnel that is necessary to properly abandon this location.

Barring unforeseen circumstances, he feels sure the task will be accomplished within a week.

Yours very truly,

KILROY COMPANY OF TEXAS, INC.



G. S. Rohe  
Vice President

GSR/sac

cc: Mrs. Essie Wiedenman  
Secretary of State  
State Capitol  
Pierre, South Dakota

October 19, 1962

Mrs. Essie Wiederman  
Secretary of State  
Secretary of Oil and Gas Board  
State Capitol  
Pierre, South Dakota

Dear Mrs. Wiederman:

Reference is made to the Kilroy #1 Scholl oil test, sec. 26,  
T. 18, N. R. 21 E., Corson County, South Dakota.

On October 8 I wrote to Mr. Snodgrass in reference to a re-  
quest of his on October 2, 1962 that the bond on this well be  
terminated.

In my letter of October 8 I suggested that Mr. Snodgrass check  
with his source of information, to make sure that the surface had  
been "restored to as nearly as possible its original condition",  
as he stated in his letter of October 2.

On October 13 Earl Cox scouted this location and found that the  
pit has still not been filled. The pit is fenced, and has some  
water in it. Although this hole was plugged in July of 1961, and  
the information was held confidential until January 23, 1962, apparently  
no attempt has been made to fill the pits and clean up the location,  
despite the exchange of letters of May 15 to May 21, 1962 between  
Mr. Snodgrass and ourselves.

Although I realize that it is our duty to scout all these  
locations, I wish that the board would notify Mr. Snodgrass that  
we do not particularly care to make a 300-mile wild goose chase,  
just to reassure ourselves that the pits are in the same condition  
that they have been in for more than a year.

It seems to me that a strong letter to Mr. Snodgrass, or perhaps  
better yet a letter to the bonding company, calling the bond on this  
well for plugging purposes might bring Kilroy to terms.

Sincerely yours,

  
Allen F. Agnew  
State Geologist

AFA/ab

cc: Mr. Blanton Snodgrass  
Mr. Earl Cox

October 8, 1962

Mr. Blanton Snodgrass  
Land Department  
Kilroy Company of Texas, Inc.  
1908 First City National Bank Building  
Houston 2, Texas

Dear Mr. Snodgrass:

Reference is made to the Kilroy #1 Scholl oil test in  
Sec. 26, T 18, R. 21 E., Corson County, South Dakota.

You state that you "have information that the drill site has  
been restored to as nearly as possible its original condition".  
On August 24 we last scouted this site and found that the mud pits  
had not yet been filled.

We will again scout the site at an early date, and if the  
pits have been filled then we can recommend further action by  
the board. In the meantime, you might wish to check with your  
source of information to see if the surface had been restored  
before August 24 or after.

Very truly yours,

  
Allen F. Agnew  
State Geologist

AFA/ab

cc: Mrs. Essie Wiederman  
Mr. Earl Cox



ESSIE WIEDENMAN  
SECRETARY OF STATE

STATE OF SOUTH DAKOTA  
DEPARTMENT OF STATE  
PIERRE

October 4, 1962

OCT 5 - 1962

ALMA LARSON  
ASSISTANT SECRETARY

Dr. Allen F. Agnew  
State Geologist  
"U" of South Dakota  
Vermillion, South Dakota

Dear Dr. Agnew:

Reference: Release of bond on the Kilroy #1  
Scholl oil test in Sec. 26, T.18 N., R. 21 E.,  
Corson County, South Dakota.

Since we received both the original and  
carbon copy of Mr. Snodgrass' letter, we are  
enclosing the carbon copy for your attention.  
Will await your reply regarding this matter.

Very sincerely,

ESSIE WIEDENMAN  
SECRETARY OF STATE  
SECRETARY STATE OIL &  
GAS BOARD

EW/ir  
Enc-1

OCT 5 - 1962

KILROY COMPANY OF TEXAS, INC.

1908 FIRST CITY NATIONAL BANK BUILDING

HOUSTON 2, TEXAS

October 2, 1962

TELEPHONE  
CAPITOL 5-0817  
8-0731

RE - #1 Scholl  
Corson County, South Dakota  
W S Kilroy Oil & Gas Lease Bond  
Federal Insurance Company  
Bond 8007-24-77

Oil And Gas Board of the  
State of South Dakota  
Pierre, South Dakota

Gentlemen:

Please refer to our letter of May 15, 1962, advising that in June, 1961, we filed the captioned Oil And Gas Lease Bond with you wherein W. S. Kilroy was named as Principal and the Federal Insurance Company as Surety. This bond was dated June 13, 1961, and drawn in the amount of \$3,000.00. This bond was renewed for a term of one year on June 13, 1962.

The bond was first filed in connection with the drilling of the #1 Scholl well located in the NE/4 NW/4 of Section 26, Township 18 North, Range 21 East, Corson County, South Dakota. The well was subsequently plugged and abandoned as a dry hole and no further or subsequent operations have been conducted on same. We also have information that the drill site has been restored to as nearly as possible its original condition.

We would appreciate the proper governmental agency of your State verifying that the location has been restored to its normal condition and, further, releasing our Surety from the aforementioned bond.

Your cooperation in this matter will certainly be appreciated.

Yours very truly

Blanton Snodgrass  
Land Department

BS:ep

cc - Wray, Couch & Elder  
1100 Bank of the Southwest Bldg.  
Houston 2, Texas

✓ Mrs. Essie Wiedenman  
Secretary, State Oil and Gas Board  
State Capitol  
Pierre, South Dakota



MAY 21 1962

SOUTH DAKOTA  
STATE GEOLOGICAL SURVEY

UNION BUILDING  
ON THE CAMPUS OF THE STATE UNIVERSITY

VERMILLION

Belle Fourche, South Dakota  
May 19, 1962

ALLEN F. AGNEW, STATE GEOLOGIST  
AND DIRECTOR  
TEL. MARKET 4-4471

Dear Allen,

*not  
filed* { Reference is made to the May 18th letter of Essie Wiedenman  
~~XXXX~~ with enclosed copy of Kilroy Company letter, both referring  
to the Kilroy #1 Scholl oil test in Corson County.

I last scouted this location February 7, 1962, and found  
the pits fenced but not filled. It is possible they obtained a  
release from the surface owner, however, I was not aware of it.  
If the pits have been filled since the February 7th examination,  
I will check it when I return from Cheyenne.

I scouted the Pure #1 Gov't test in Butte County 9-25-61.  
At that time the pits were not adequately filled and ~~XXX~~ surface  
restored. They will probably be wanting a release soon and we may  
do them a service by informing them that the restoration as of  
the above date is not satisfactory.

Today I checked by phone with Fishel to see if the Johnson  
#1 Fishel pits had been filled. They had not. It would seem that  
Mr. Weygint and the bonding company could assume Johnson is not  
going to do anything and have the bonding company meet their  
obligation without delay.

Sincerely,

Earl Cox

*2/19/62*

MAY 19 1962



STATE OF SOUTH DAKOTA  
DEPARTMENT OF STATE  
PIERRE

May 18, 1962

ESSIE WIEDENMAN  
SECRETARY OF STATE

ALMA LARSON  
ASSISTANT SECRETARY

Dr. Allen F. Agnew  
State Geologist  
"U" of South Dakota  
Vermillion, South Dakota

Dear Dr. Agnew:

Reference W. S. Kilroy Oil and Gas Lease Bond-  
Federal Insurance Company Bond 8007-24-77 for #1  
Scholl well located in the NE/4 of the NW/4 of  
Section 26, T-18-N., R-21-E., Corson County, South  
Dakota.

Enclosed please find verifax copy of a letter  
received today from Mr. Snodgrass.

We will await your reply concerning this well  
and will bring it to the attention of the Board when  
we hear from you.

So far we have had 3" of rain and no complaints,  
and still raining.

Very sincerely,

ESSIE WIEDENMAN  
Secretary of State

EW/ir  
cc- Earl Cox

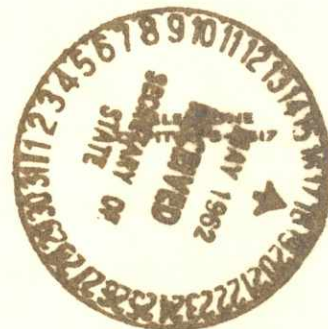
*Hand pit not filled 2/7/62  
Sunk on loc "*

KILROY COMPANY OF TEXAS, INC.

1906 FIRST CITY NATIONAL BANK BUILDING

HOUSTON 2, TEXAS

May 15, 1962



#1 Scholl  
Corson County, South Dakota  
W. S. Kilroy Oil & Gas Lease Bond  
Federal Insurance Company Bond 8007-24-77

Oil And Gas Board of the  
State of South Dakota  
Pierre, South Dakota

Gentlemen:

Our records indicate in June, 1961, we filed the captioned Oil And Gas Lease Bond with you wherein W. S. Kilroy was named as Principal and the Federal Insurance Company as Surety. The bond was dated June 13, 1961, and drawn in the amount of \$3,000.00.

This bond was filed in connection with our drilling the #1 Scholl well located in the NE/4 of the NW/4 of Section 26, T-18-N, R-21-E, Corson County, South Dakota. This well was plugged and abandoned as a dry hole and we do not anticipate any further operations on the above described lands. In view of the above we will appreciate your furnishing us with a Release releasing the Surety named in this bond.

Yours very truly,

*Blanton Snodgrass*  
Blanton Snodgrass  
Land Department

BS:dd

cc: Mr. Reid M. Waltman  
Kilroy Company of Texas, Inc.  
2150 First National Bank Bldg.  
Denver 2, Colorado

Wray, Couch & Elder  
1111 Bank of Southwest Bldg.  
Houston 2, Texas  
Attn: Mrs. Garrison

January 29, 1962

Mrs. Essie Wiedenman  
Secretary of State  
Secretary, Oil and Gas Board  
State Capitol  
Pierre, South Dakota

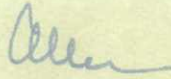
Dear Mrs. Wiedenman,

Reference is made to the Kilroy #1 Scholl oil test in Sec. 26,  
T. 18 N., R. 21 E., Corson County, South Dakota.

In response to a telephone call from Earl Cox while I was  
gone last weekend, I have checked the files and find that the  
Kilroy well came off the confidential list on January 23. In  
addition, I find that we have copies of some information that  
we had neglected to send you. This includes a copy of all the  
logs, and the geologist's log on the hole.

In looking further, I see that although we had typed up  
the scout sheets, I had neglected to send them to you also.  
They are enclosed herewith. Sorry.

Sincerely yours,



Allen F. Agnew  
State Geologist

AFA/bb

Enc.

JAN 25 1962



SOUTH DAKOTA  
STATE GEOLOGICAL SURVEY

UNION BUILDING  
ON THE CAMPUS OF THE STATE UNIVERSITY

VERMILLION

ALLEN F. AGNEW, STATE GEOLOGIST  
AND DIRECTOR  
TEL. MARKET 4-4471

Belle Fourche, South Dakota  
January 24, 1962

Re: Kilroy #1 Scholl oil test  
Corson County, So. Dak.

Dear Allen,

The Secretary of State called yesterday. Someone who owns land in the vicinity of the above test was in to see the test records, now that the six months confidential period is past. The O & G Board files carry little information on this test, and she wanted to know if the well had been plugged. I informed Mrs Wiedenman it had been plugged, and that I was there at the time.

The well was plugged 7-23-61. The 10 sack surface plug and marker was to be placed the next day but I did not stay over for that work, and have not been back to the location since. It may be that the marker and 10 sack surface has not been placed and this may be the basis for the belief it is unplugged. The mud pits were still fenced at the time Circle "A" moved their rig to the Miami #1 Federal location in December, 1961, according to the tool pusher.

I will check this location out in the near future.

Perhaps you would be able to bring to Pierre, January 30th, whatever is necessary to complete their file on this test.

Sincerely,

Earl Cox

JAN 24 1962

Belle Fourche, South Dakota  
January 23, 1962

Mr. Charles Dyer  
Geologist  
US Geological Survey  
P.O. Box 1412  
Huron, South Dakota

Dear Charlie,

The six months confidential period on the Kilroy-Swindler #1 Scholl oil test terminates today so I will send you what I have on it.

Location: center NENW-26-18N-21E., Corson County, South Dakota  
Spudded - 6/28/61  
plugged - 7/23/61  
T.D. 8128  
Elevation: ground 2311; KB - 2323  
Logs run: Gamma sonic and induction electrolog  
Cores taken; #1 5832-5842 No show.  
                  #2 5878-5897 No show.

Tentative log tops by Kilroy geologist

|                       |                     |
|-----------------------|---------------------|
| Greenhorn 2460        | Lodgepole 4922      |
| Newcastle 2997        | Three Forks 5244    |
| Dakota silt 3235-3250 | Nisku 5360          |
| (no Dakota present)   | Duperow 5397        |
| Piper 3575            | Souris River 5490   |
| Lime 3604             | Interlake 5590      |
| Minnelusa 3737        | Stony Mountain 5703 |
| Charles 4399          | Red River 5805      |
| Miss Canyon 4605      |                     |

The sample tops varied a great deal from the above tops. The Dakota sample top was reported at 3293 with the information that it flowed water until mudded off.

DST #1 4470-4580. Taken because of porosity. Blow immediate and weak, increased to strong in 22 min., remained strong till shut in except occasional ~~XX~~ pressure drops. Initial shut in 30 min., tool open two hours; final shut in 2 hrs. 15 min. Recovered 945 feet muddy water. SIP: 2024-1954; FP; 126-452; HP; 2506-2492. Maximum temperature - 134°.

Mr. Charles Dyer  
January 23, 1962  
Page 2

DST # 2 4583-4743. Taken because of porosity. Blow increased to strong in 60 seconds, remained strong remainder of open period. Initial shut in 30 min., tool open one hour, final shut in 30 min. Recovered 2737 feet muddy sulphur water. SIP; 2065-2065; FP; ~~XXXX~~ 352-477; HP: 2565-2565.

DST # 3 5873-5897. Recovered 600 feet water cut mud and 2080 feet black sulphur water. SIP: 2387-2482; FP: 248-1039; HP: 3286-3258. Maximum temperature 135 .

As far as I know there were no analyses of formation fluids.

Let me know if I can send you any other information.

Sincerely,

  
Earl Cox

cc: Allen Agnew

SEP 1

KILROY COMPANY OF TEXAS, INC.

2150 FIRST NATIONAL BANK BUILDING

DENVER 2, COLORADO

TELEPHONE  
KEYSTONE 4-0816

HOME OFFICE  
1908 FIRST CITY NATIONAL BANK BLDG.  
HOUSTON 2, TEXAS  
TELEPHONE-CAPITOL 5-0517

September 14, 1961

Re: W. S. Kilroy - J. S. Swindler  
#1 Scholl  
C NE NW 26-18N-21E  
Corson County, South Dakota

American Stratigraphic Company  
17 North 31st St.  
Billings, Montana

Attention: Mr. Fred McCotter

Dear Sirs:

With reference to your letter of August 24,  
captioned subject, this well is still tight. The State of  
South Dakota, Allen F. Agnew, State Geologist & Director,  
Union Building, Vermillion, South Dakota should be furnished  
1 cut.

Thank you for your cooperation in this regard.

Yours very truly,

R. M. Waltman

vn

cc: State of South Dakota ✓  
Allen F. Agnew, State Geologist & Director  
Union Building  
Vermillion, South Dakota

AUG 10 1961

KILROY COMPANY OF TEXAS, INC.

2150 FIRST NATIONAL BANK BUILDING

DENVER 2, COLORADO

HOME OFFICE  
1908 FIRST CITY NATIONAL BANK BLDG.  
HOUSTON 2, TEXAS  
TELEPHONE-CAPITOL 5-0517

TELEPHONE  
KEYSTONE 4-0816

August 8, 1961

Re: W. S. Kilroy & J. S. Swindler  
#1 Scholl  
C NE NW Sec. 26-18N-R21E  
Corson County, South Dakota

Dr. Allen F. Agnew, State Geologist  
South Dakota State Geological Survey  
Science Hall  
Vermillion, South Dakota

Dear Dr. Agnew:

Enclosed are three copies each of the Well Plugging Affidavit,  
Notice of Intention to Abandon Well and Well and Core Record, State Forms  
5, 7 and 9.

Under separate cover, we are sending 2 copies each of the logs  
run in the well and three copies of Mr. Ted Sheldon's well report.  
Mr. Sheldon's report covers well history, sample description, cores,  
DST's, fluid and core analysis, etc., and is a sufficiently complete  
dossier of this well to be of considerable aid as a handy reference to  
your department. Should you wish further information, kindly let us know.

Thank you for your cooperation in the drilling of this well.

Yours very truly,

*Reid M. Waltman*  
Reid M. Waltman,  
Area Geologist

AV:vn

Encl.

*P.S. As previously requested please keep  
the above data confidential.*

*Rm Waltman*

JUL 7 1961

Belle Fourche, So. Dak.  
July 6, 1961

J. Terry Sherman  
Shell Oil Company  
P.O. Box 987  
Bismarck, North Dakota

Dear Terry,

The Kilroy #1 Scholl oil test in NENW-26-18N-21E., in Corson County, South Dakota was spudded June 28, 1961.

Kilroy has asked that the State Survey consider all information on this hole as confidential.

Sincerely,



Earl Cox  
Geological Engineer



SOUTH DAKOTA  
STATE GEOLOGICAL SURVEY

UNION BUILDING  
ON THE CAMPUS OF THE STATE UNIVERSITY

VERMILLION  
Belle Fourche, So. Dak.  
July 5, 1961

JUL 6 1961

2 copies

ALLEN F. AGNEW, STATE GEOLOGIST  
AND DIRECTOR  
TEL. MARKET 4-4471

Dear Allen,

Confidential: On July 1st, the Kilroy #1 Scholl was at 3250. The only sample top picked was the Greenhorn at 2500 ±. You have probably seen Kilroy's letter of June 27th to the Oil and Gas Board in which they ask that all information on the well be regarded as confidential for the six months period.

Hollingsworth has done nothing at his location in Fall River County. His 90 day extension will be up August 11. Under the new laws he will need to increase his bond to \$5,000 before an additional extension can be granted.

On July 3rd, I scouted the Sparks #1 Cornelison. Nothing has been done at this location ~~XXX~~ since January.

My scout sheets of July 3rd will bring you up to date on the three Helms wells. Helms showed me the copy of a letter sent to the O & G Board asking for a 45 day extension in which to complete work on the wells. Helms was slow in starting work on these wells to comply with the boards orders, however, it is presumed this was from lack of funds. Since he has started the workover jobs, the work has ~~XXXXXXXXXX~~ been handled with fair diligence. It is recommended that you consider the extension favorably.

Helms tells me there has been active oil leasing in the Oelrichs area.

June 29th was spent in the field northeast of Faith with Waage, Pettyjohn, Baker, Lange, Michael. June 30th was spent in the field with Waage, Tullis, Black and Kulik in the area from Howes to Red elm. Both of these trips were quiet productive and Dr. Waage experience in the upper Pierre, Fox Hills and Hell Creek was of special help to the Black and Lange parties.

*Handwritten: Not for Agnew's opinion*

Black says that one and possibly both of the altimeters are so much in error they can't be used. I guess this means sending them in for adjustment or using the plane table. Black would like to have you bring the photo index of his area as it is very time consuming to try and locate the photos of an area without it. Black felt that air photos of T16 & 17 E between Faith and the Cheyenne would be helpful.

Pettyjohn says his photos are small scale he can't use them. He would like 3 or 4 inches to the mile. I have checked with the soil people in Faith and they say we can check out their 4" to a mile photos in small bunches and keep them for about a week at a time. I have told both Black and Pettyjohn about this so we may not want to order more photos at this late state of the summer.

Sincerely,

*Earl Cox*  
Earl Cox

COMMISSION

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Lauren A. Davis, Belle Fourche  
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SOUTH DAKOTA  
*State Water Resources Commission*

J. W. GRIMES, CHIEF ENGINEER AND EXECUTIVE OFFICER  
STATE OFFICE BUILDING

PIERRE, SOUTH DAKOTA



July 3, 1961

Alice M. Sudheimer  
1905 Bayard Ave.  
St. Paul 16, Minn.

I have been advised that the W. S. Kilroy  
has obtained a Permit to Drill for Oil and Gas on your land in  
Section 26, T 18N, R 21 E.

Occasionally, owners of land consider converting abandoned oil wells into water wells. Please advise me whether or not you intend to convert the oil well drill hole on your land into a water well if water is encountered and the drill hole is abandoned as an oil well.

If you are considering making a water well out of the abandoned oil well drill hole, special considerations are necessary to comply with the State's oil and water laws. The abandoned oil hole must be properly plugged and the water well properly constructed. All conversion work will be at your expense. The cost will vary, depending upon the characteristics of the drill hole, but such cost will be in the neighborhood of \$5,000 or more. Usually another driller and drill rig will have to be arranged for. This other drill rig and casing and other materials will have to be on hand to take over immediately after the special oil well plugging is completed, because the drill hole cannot be left open for any appreciable length of time without spoiling it. Approval of plans for construction of the water well will be required, and a bond covering proper construction may be required. Also, a water right may be required. All of these arrangements take considerable time to accomplish.

Please advise me immediately if you plan to convert the oil well drill hole into a water well. We both hope that a producing oil well results from the drill hole on your land; however, if not and you are planning on a water well, we must start making arrangements now.

Sincerely,

J. W. GRIMES  
Chief Engineer  
Executive Officer

WILLIAM S. KILROY  
1908 FIRST CITY NATIONAL BANK BUILDING  
HOUSTON 2, TEXAS

JUN 29 1961

TELEPHONE  
CAPITOL 5-0517

OIL OPERATOR

June 27, 1961

Please Address Reply to:  
2150 First National Bank Bldg.  
Denver 2, Colorado  
Telephone KE4-0816

Re: W. S. Kilroy - Oil and Gas Lease  
Bond - Federal Insurance Company Bond  
No. 8007-24-77

Via Air Mail

State Oil & Gas Board  
Capitol Building  
Pierre, South Dakota

Gentlemen:

This is to confirm that a telephone conversation with Chubb & Sons, Inc., Dallas, Texas, indicates a rider for our drilling bond will be forwarded to you today. This rider, of course, is necessary since we moved the location of our drilling well from the NE NE to the NE NW of Section 26-T18N-R21E, Corson County, South Dakota.

When you have received the rider, we would appreciate a collect telephone call that our permit has been fully approved and granted. Our phone is KEystone 4-0816, Denver, Colorado.

We also wish to state by this letter that the W. S. Kilroy - J. S. Swindler #1 Scholl oil test be regarded as a "Confidential" hole and that the information from this test shall not be released except through the operators until the 6 months' confidential period granted by South Dakota regulations has expired.

Your attention to this will be greatly appreciated.

Yours very truly,

R. M. Waltman,  
Area Geologist.

RMW:vn

cc: Mr. Earl Cox, State Geological Survey,  
Belle Fourche, South Dakota.

State Geological Survey,  
Vermillion, South Dakota

JUN 28 1961

June 22, 1961

Mr. W. S. Kilroy  
2150 First National Bank Bldg.  
Denver 2, Colorado

Dear Mr. Kilroy:

Reference is made to the #1 Scholl Well  
for which we are enclosing permit to drill,  
together with the minutes of the State Oil and  
Gas Board pertaining to this well and also your  
receipt for \$25.00

Very sincerely,

(MRS.) ESSIE WIEDENMAN  
SECRETARY OF STATE  
SECRETARY STATE OIL  
AND GAS BOARD

EW/ir  
CC- Dr. Agnew  
State Geologist

COPY

JUN 28 1961

WILLIAM S. KILROY

1908 FIRST CITY NATIONAL BANK BUILDING

HOUSTON 2, TEXAS

June 19, 1961

TELEPHONE  
CAPITOL 5-0517

OIL OPERATOR

Please Address Reply to:  
2150 First National Bank Bldg.  
Denver 2, Colorado

W. S. Kilroy and J. S. Swindler  
Re: #1 Scholl  
C NE NW Sec. 26-T18N-R21E  
Corson County, South Dakota

Mrs. Essie Wiedenman, Secretary  
South Dakota State Oil & Gas Board  
State Capitol  
Pierre, South Dakota

Dear Mrs. Wiedenman:

To confirm our telephone conversation today with Mrs. Freize, of your office, we have been forced to change the location of our test well in Section 26 from the NE NE to the Center of the NE NW/4 of Section 26-T18N-R21E because of title difficulties. We would greatly appreciate your changing our Notice of Intention to Drill Form to include the corrected location and to change the name of the owner of the well from W. S. Kilroy and H. L. Swindler to W. S. Kilroy and J. S. Swindler. These are the only changes we wish to make on this form.

We do not have additional copies of the Notice of Intention to Drill Form and we wish to use this letter to correct the above form. We would greatly appreciate having our permit issued as soon as possible as we plan to commence drilling by June 25, 1961.

Your attention to this matter will be very greatly appreciated. A copy of our survey plat of the above location will be forwarded to you in the very near future.

Very truly yours,

*R. M. Walcott*  
R. M. Walcott  
Area Geologist

RMW:vn



January 9, 1961  
(dictated January 2, 1961)

Mr. Reid M. Waltman  
Kilroy Company of Texas, Inc.  
Rocky Mountain Area  
2150 First National Bank Building  
Denver 2, Colorado

Dear Mr. Waltman,

Thank you for your letter of December 29, 1960, concerning your proposed location in Corson County, South Dakota. We will be looking forward to its drilling later on this year, and wish you success in the venture.

I am enclosing a copy of the South Dakota Oil and Gas Law and the Rules and Regulations of the Oil and Gas Board. A bill is to be introduced into the Legislature this month, to revise the law, and if so, new rules and regulations will be formulated. They are patterned pretty much after the Interstate Oil Compact Commission Model Law.

I am very much interested in the proposed talk that you plan to give before the Rocky Mountain Association of Petroleum Geologists in Denver in the near future, dealing with the correlation of magnetometer and gravity surveys with geologic structure.

As you probably are aware, Daniel Lum of our Survey gave a talk at the AAPG meeting in Billings last February, dealing with the gravity surveys that he made for us a year ago. We would appreciate having a copy of your talk and of the maps, unless you plan to publish it in the near future.

We feel that this is something that is very important to South Dakota's oil future, as well as to its basic geologic information.

Very truly yours,

Allen F. Agnew  
State Geologist *A.F.*

AFA/bb

Enc.

DEC 29 1960

KILROY COMPANY OF TEXAS, INC.

2306 BANK OF THE SOUTHWEST BUILDING

ROCKY MOUNTAIN AREA  
2150 FIRST NATIONAL BANK BLDG.  
DENVER 2, COLORADO  
TELEPHONE KEYSTONE 4-0816

HOUSTON 2, TEXAS  
December 29, 1960

TELEPHONE  
CAPITOL 5-0517

Dr. Allen F. Agnew, State Geologist  
South Dakota State Geological Survey  
Union Building  
Univ. of South Dakota  
Vermillion, South Dakota

Dear Dr. Agnew:

In acknowledgment of your November 30th letter to Mr. Kilroy, we are indeed sorry you have made needless trips scouting our rumored location in the Standing Rock area, Corson County. We have not made a formal location for a test well on this prospect but hope to have a well drilled either in the late spring or early summer of 1961. In any case we will keep you informed of when we expect to have a well drilled in this area and will promptly advise you prior to commencement date of such a test.

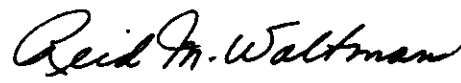
We would appreciate receiving a copy of South Dakota regulations governing the drilling of test wells for oil or gas and necessary commencement papers, if any. At this time we are not sure whether operations will be under our name or drilled for us. In any event, we will be happy to cooperate with your office.

During the early part of 1961, I plan to give an informal luncheon talk before the Rocky Mountain Association of Petroleum Geologists in Denver on the oil and gas possibilities of northwestern South Dakota. As part of the talk I also plan to present several slides correlating gravity and magnetometer surveys with South Dakota structure. I would like to have the South Dakota Geological Survey's permission to incorporate into these slides, with the proper acknowledgment, portions of the "Magnetometer Map of Harding and Perkins Counties, South Dakota" by Bruno C. Petsch, 1958, published by the survey. I am sure the publicity will be beneficial to your state.

Mr. Swindler, our associate in the South Dakota acreage, is not the same as the Mr. Swindler you referred to from Mott, North Dakota.

If we can be of further assistance, please advise.

Very truly yours,

  
Reid M. Waltman

RMW:vn

November 30, 1960

Mr. W. S. Kilroy, President  
Kilroy Co. of Texas, Inc.  
2306 Bank of the Southwest  
Houston 2, Texas

Dear Mr. Kilroy:

At intervals since the last part of August, we have heard reports of a location by you and a Mr. Swindler, in the area 5 or 6 miles north of Isabel, near the common corner of Corson, Dewey, and Ziebach Counties, South Dakota.

I scouted your location twice in late August and early September, and my geologist from Belle Fourche, South Dakota has likewise scouted it several times, but we have found no activity.

As you probably are aware, the State Geologist is the technical advisor to the State Oil and Gas Board, and is charged with the responsibility of supervising the drilling and completion or abandonment of oil tests in the State.

Would it be possible for you to tell us whether you contemplate drilling this winter, or whether moving on the location is likely to be delayed until sometime next spring. This will save us several trips to this area this winter, if you are able to give us this information.

In addition, is the Mr. Swindler that we have heard about the Mr. M. F. Swindler from Mott, North Dakota, who is listed in the Rocky Mountain Sales and Service Directory?

Very truly yours,



Allen F. Agnew  
State Geologist

AFA/bb

# MISCELLANEOUS

**NO MISCELLANEOUS  
INFORMATION FOR THIS WELL  
AS OF 5/11/2011**